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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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M Hikes Dividend, Plans Stock Split

ARMONK, N.Y. — IBM's board of directors has given the company's stockholders a two-fold Christmas gift: a quarterly cash dividend of $3.44 per share on its common stock and a four-for-one stock split, which will be recommended at the annual meeting scheduled for April 30.

The latest dividend represents an increase of 56 cents from the former quarterly rate. The dividend is payable March 10 to holders of record Feb. 14.

"This action brings IBM's stock to a more competitive posture with stock of other quality companies, and we hope the new price will be attractive to small investors," an IBM spokesman said.

The stock split would be made effective by issuing three additional shares of IBM stock for each share held as soon as possible after May 10, the tentative date for the split.

Although IBM has not split its stock for the last six years, the move was expected, according to Harry Edelson, vice-president of research at Drexel Burnham Lambert, Inc.

After the split, the stock's lower price will make it a more marketable commodity on Wall Street, Edelson noted. "In an age of consumerism, it might be embarrassing to be reporting earnings per share of $25 when other firms are reporting $1 or $2 per share," he added.

Some DPers May Be Exempt From 7% Lid on Pay Raises

By Marcia Blumenthal
CW Staff

WASHINGTON, D.C. — There might be good news for DP personnel in a recent ruling that has modified President Carter's request that employers hold salary increases to 7%.

Job categories for which employers can document labor shortages have been exempted from the 7% ceiling by the Council on Wage and Price Stability. While no formal announcement of shortages in the DP sector has been made, those jobs listed in "Occupations in Demand at Job Service Offices," a monthly publication of the U.S. Department of Labor, are usually considered hard to fill.

In November, the publication listed 750 jobs available in the business programmer and systems analyst categories. Six hundred of those jobs were still unfilled at the end of November, an official of the U.S. Bureau of Labor Statistics reported.

Connecticut, New York, Virginia and parts of Minnesota are experiencing particular shortages in those job categories, the bureau said.

The Council on Wage and Price Stability's exemption regulation stipulates that raises in excess of 7% may be granted when such increases are "necessary to attract or retain employees in a particular job category because of an acute labor shortage," provided certain conditions are met.

Criteria for Shortages

According to the regulation, labor shortages exist if:

- The proportion of vacancies during the previous quarter has increased abnormally from the vacancy rate experienced in the prior two years.
- The time required to fill vacancies has increased abnormally from that required during the previous two years.
- Pay rates for entry-level personnel have increased abnormally from the usual starting pay of the prior two years.
- The local employment service agency has certified that an acute labor shortage exists.

Various employment surveys have indicated that the demand for DP specialists has grown quickly, perhaps outpacing the supply. A recent survey by National Personnel Consultants [CW, Aug. 14] showed the demand for DP specialists grew 21.7% since 1977 and salary increases exceeded 12% for the same period.

A survey by the Association for Systems Management [CW, July 3] found the median salary for systems analysts had grown from $18,749 in 1974 to $24,786 in 1977 — a 32% increase. That study also indicated that a growing number of systems analysts have

(Continued on Page 4)

Conversational Editing, RJE

'Prepso' Backs IBM Programmers

By Don Leavitt
CW Staff

SAN FRANCISCO — Continuing the line of support it started with the introduction of the Maestro programmer workstation [CW, Oct. 9], Itel Corp. last week announced the availability of the Prepso conversational text editing and remote job entry (RJE) programming system.

Developed by Armaggedon Associates of Danville, Calif., Prepso is available for use under IBM's OS/VS1 on 370 series or compatible mainframes. It is being adapted to the MVS environment, and that implementation should be ready by the end of the first quarter of 1979, according to an Itel spokesman.

The product is a reentrant system, allowing concurrent use by as many terminal users as the host computer can support. There is nothing within the Itel software that imposes a limit on the number of programmers who can use it at the same time, the spokesman claimed.

The software enables users to create data files and to write and compile programs conversationally at local or remote terminals — CRT or hard-copy — and then to trigger execution of the programs on an RJE basis.

While that in itself is not unique — the spokesman readily named Roscoe from Applied Data Research, Inc., for example, as a competitor — Prepso does have some advanced capabilities. For instance, it allows terminal users to track where their work is in the sub-

(Continued on Page 8)

Univac Extends Top of Mini Line

By Jeffry Beeler
CW Staff

IRVINE, Calif. — Univac recently expanded its V77 minicomputer series with a high-end system that reportedly provides twice the processing power of the family's previous top-of-the-line model.

At a recent press conference here, Univac officials described their latest minicomputer system, the V77-800, as an "evolutionary extension" of the V77 family, which the company acquired more than 18 months ago from Varian Data Machines. The three smaller members of the V77 family include, in ascending order, the V77-200, 400 and 600 systems.

As part of the V77-800's unveiling, Univac also introduced a multitasking, terminal-oriented operating system called Summit (see Page 25) and announced the extension of Distributed Communications Architecture (DCA) to both the V77-600 and 800. Summit runs on the two largest V77 models and supports Pascal as well as the QL/77 inquiry/update language, according to a Univac spokesman.

In computing power, the V77-800 falls somewhere between Digital Equipment Corp.'s PDP-11/70 and its VAX-11/780, the spokesman explained. The Univac high-end mini is also said to belong to the same product class as the larger models of the Data General Corp. Eclipse line.

Suited for both commercial and scientific applications, the V77-800 reportedly serves as a stand-alone system, front-end processor or as part of a distributed processing network built around Univac 90, Univac 1100 or IBM 370 series mainframes.

(Continued on Page 8)

U.S. vs. IBM Could End Next Year

By Connie Winkler
CW Staff

NEW YORK — The U.S. vs. IBM antitrust trial, now in its fourth year here, could end in late 1979, according to one source close to the case — and it might go to the judge sooner than that, thanks to the technique of narrative statements now being tried.

Even Judge David N. Edelstein, who's been sitting alone through it all, has seen what was inconceivable until recently — the light at the end of the tunnel. In a chambers conference this month, Edelstein said real progress has been made in the trial.

Robert J. Staal, who is in charge of the Justice Department's case, believes the trial could wind up in 12 to 18 months, especially if the attrition rate of IBM witnesses continues. IBM intended to call about 200 witnesses (the government planned 190), but it has pared its list to 45 or 50.

Thomas D. Barr, IBM's lead attorney, won't predict how long the trial is going to run, even though he is enthusiastic about the use of narrative statements to present witnesses' direct testimony. "Every projection I have made in this case has been wrong," Barr said.

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NCIC Lists New York's 'Wanted,' But City Doesn't Want Them All

By Tim Scannell
CW Staff

NEW YORK — Limited by tight municipal budgets, judicial officials here are refusing to extradite certain individuals accused of crimes committed in New York City but apprehended in other states after being listed in the National Crime Information Center's (NCIC) data bank.

A number of police officials have complained about New York City's shoe-string use of the nationwide system. NCIC guidelines stipulate that if a police department knows ahead of time it will not extradite an alleged felon, it should not enter the record into the system.

If the extradition process is canceled for any reason, the fugitive's file should immediately be purged from the computer, according to Frank Buell, chief of the Federal Bureau of Investigation's NCIC network.

"As long as a suspect is a fugitive and still on the loose, he will remain in the system," Buell noted.

Criteria for Extradition

New York City district attorneys are selecting individuals for extradition according to the severity of the crime, the amount of substantial evidence, the willingness of the complainant to testify and the availability of funds, Manhattan Assistant District Attorney Leonard Rienzi said.

"Obviously, if it's a serious case and if we can prove beyond a reasonable doubt that [the defendant] will go to state prison ... then we're likely to bring him back from another jurisdiction," Rienzi explained. But "it doesn't pay for us to spend $500 or $1,000 bringing someone back from Washington or Florida or Chicago only to have him come in here and get a $25 fine."

New York City's pick-and-choose philosophy has already affected the operations of several police departments across the country that have suffered embarrassment and faced the possibility of a released individual filing false arrest charges.

"There are always risks involved in arresting fugitives, so it's kind of a letdown when the other jurisdiction says it doesn't want the guy," William McGill, chief of the Washington, D.C., fugitive squad, said. Each year his 13-member unit encounters close to 2,000 fugitives wanted in other jurisdictions; while he said he couldn't estimate how many extraditions are refused, he maintained that New York City is by far the biggest offender.

McGill's unit recently dealt with New York City in a case concerning a 20-year-old who, according to the NCIC record that was routinely pulled when the suspect was stopped for a minor traffic violation, was wanted in Manhattan for homicide. After further investigation, McGill discovered that New York City authorities not only didn't want to extradite the suspected felon, but that the charge was really attempted homicide.

New York police told McGill that the charge against the defendant would probably be reduced to assault and that the case wasn't worth the expense of extradition.

Det. Harry Balian of the Maricopa County (Ariz.) Sheriff's Office has also experienced New York City's extradition refusals and shares McGill's apprehension about the city's NCIC records. "New York and New Jersey are pretty good for making entries [into the NCIC] and then not extraditing on them, even though the entry is valid and the warrant outstanding," Balian said.

The district attorneys of those states complain of the substantial amount of money needed for extraditions and "will usually reduce the charge to in-state-only pickup," Balian stated.

New York just doesn't have the money or the time to chase every single fugitive, assistant district attorney Rienzi said. He pointed out that in Manhattan alone, roughly one-fourth of the 100,000 defendants arrested each year jump bail.

A district attorney's office has no control over updates or purges of NCIC records, he added. That responsibility lies with the arresting police department but, because of New York City's financial problems, file changes and deletions may be backlogged.

Precautionary Measures

Several police departments in the nation have instituted precautionary measures in handling NCIC arrests to avoid embarrassing situations and complicated false arrest suits. Most go out of their way to gather information about a warrant, its date of inception and who authorized it.

In a few cases, in order to avoid rearresting an individual a state has refused to extradite, the out-of-state officers will remove or alter an outstanding record — although this is in violation of NCIC rules.

In general, however, most will have to play it by ear when dealing with states that consistently refuse to follow up on fugitive extraditions. In the future, "we will get the information as to where the individual [listed in the NCIC] stands and notify New York City, and if it does not respond within a certain period of time, then we won't even arrest the man," McGill said.

Note to Subscribers

This is *Computerworld's* annual combination issue, carrying the dates of Dec. 25 and Jan. 1.

Our next regular publication will be dated Jan. 8.

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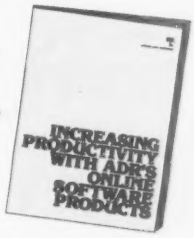

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IBM-Compatible CPUs Proliferate in Past Year

Review & Forecast

By E. Drake Lundell Jr.
CW Staff

Some of the biggest news for users in 1978 was a mind-boggling array of IBM software-compatible mainframes as manufacturers of the gear seemed to pop up almost monthly.

And the established manufacturers of software-compatible processors — Itel Corp. and Amdahl Corp. — reached new highs in shipping rates, making the two vendors, when taken together, the largest independent makers of IBM 370/158 and above size systems.

Both of these trends will have repercussions that will ripple through the computer community for years to come.

At the end of 1977, users had only Amdahl and Itel offering plug-compatible alternatives to IBM mainframes, and they were both clustered at the high end of the IBM range. In quick succession during the year, however, other plug-compatible manufacturers entered the arena, bringing out machines that compete with the entire 370 line of equipment — machines they hope will be competitive with the E series of mainframes that IBM is expected to announce during the first quarter of 1979.

On the low end, users got an alternative to the IBM 370/115, 125 and 135 with the Cambridge Memories, Inc. models 1, 2 and 3 software-compatible processors.

Moving up, there was a great deal of action in the 370/138 arena, with Nanodata Corp. offering its VMX200, Magnuson Systems Corp. pushing the M80/3, National Semiconductor Corp. wading in with the Model 400, National CSS, Inc. (NCSS) offering the Two Pi Co. processors packaged with NCSS software as the 3200 system, Itel offering the AS/3-3, Citel Corp. pushing its 30 Model 3 and Control Data Corp. introducing the Omega 480-I.

In the 370/148 class, almost all of those players were again represented: Itel with the AS/3-4, AS/4 and AS/5-1; CDC with the Omega 480-II, Nanodata with the VMX400, Citel with the 30 Model 4 and Magnuson with the M80/4.

At the upper end of the line and competing against the newer IBM 30 series of computers, Itel and Amdahl remained the only ones in the ring — Itel with the AS/5-3, 7031, AS/6-1 and AS/6-2 competing with the IBM 158-3, 3031, 168-3 and the 3032, respectively.

Amdahl stuck to its niche at the large end, with the 470V/5, V/5-II, V/6 and V/6-II competing with the 370/168-3 and the 3032 and with the 470V/7 and V/8 offering competition against the top-of-the-line IBM 3033.

So, from two alternative sources of software-compatible processors at the beginning of the year, the number grew to eight, and the range of independent alternatives spread from the high end of the line down through the entire IBM 370 line.

While the effects of the increases in IBM-compatible CPUs cannot be seen at this time, the entry of so many firms into the field — and the success of the most established players in the field — raised tricky questions both for users and for the more established mainframe makers such as Burroughs Corp., Univac, Honeywell, Inc., CDC and NCR Corp.

U.S. vs. IBM Trial Could End in '79

(Continued from Page 1)

Nevertheless, the optimistic predictions are revolutionary in this case, which has spanned more than 575 court days and spawned 86,000 pages of transcript. It took the government three years to go through 52 witnesses, with one witness on the stand 78 days. IBM started presenting its witnesses when the government rested its case on April 26; despite a month's recess, the firm has already gone through 14 witnesses.

What has speeded up the trial so dramatically is a technique for the introduction of direct testimony from IBM witnesses with a narrative statement, instead of through questioning by lawyers. Both sides negotiate the narratives beforehand.

The testimony of the past seven witnesses has been completed in 18 court days, although those 18 court days were spread over a two-month period. Without the narratives, the witnesses might have taken seven or eight weeks of court time, Edelstein noted.

Submitting the narratives in writing to the court, plus preliminary questions, can take as little as 20 minutes. Before the narratives, direct examination took days; one witness this summer took 11 days. The testimony was frequently rambling and interrupted with intense objections from both sides.

"The narratives are really unique because what you have seen accomplished is the direct examination, with but preliminary clarifying statements, in an exceedingly short time," the judge said. "The narratives are one of the most forward steps I have seen in any complex case."

He predicted they will be used in the future in complicated litigation. U.S. vs. IBM will provide the precedent for other judges to implement the technique, he added.

This is the first trial where such narratives have been used in precisely this way. Written statements are often used in hearings before federal and state agencies, such as the Federal Trade Commission or a state's Public Service Commission. However, any kind of statement — including hearsay — can be made in those agency statements, and there is no negotiation of the statement by the adversaries before presentation, Edelstein pointed out.

Edelstein has been enthusiastic enough about the narrative technique — even though its use has been limited in the IBM trial — to recommend it to the Presidential commission studying antitrust actions.

Edelstein, who has been criticized for his slow handling of the trial, said he seized upon the narrative technique this fall when faced with an apparently unending controversy over the topic of an upcoming IBM witness' testimony. Edelstein has used the technique in criminal trials with expert witnesses — for example, a chemist called to testify that a powder in a glass envelope was not flour but the controlled substance taken at the time of an arrest.

The narrative not only allows the witness to put his thoughts on paper in an organized and thoughtful fashion, but it allows both sides to eliminate major objections to a witness' testimony. However, there are still many objections voiced in court.

"On balance, it's a very good technique that's working well," Staal said. He added that "we aren't terribly pleased that we're not on a full schedule." To allow Cravath, Swaine & Moore — IBM's counsel — time to prepare the narrative statements, court has been meeting two to four days a week.

With one recent witness, the government agreed to eliminate the deposition usually taken beforehand with both parties present where attorneys determine the parameters of what the witness would say in court. "We're committed to evaluate everyone, and it may well be that we can eliminate a deposition — we have to wait until we see the narrative," Staal said.

When Barr originally agreed to the narratives, he asked that the depositions be discontinued. Staal would not agree to that.

Negotiations to get both parties to accept the narrative technique were like the Arab-Israeli talks at Camp David, one trial observer remarked.

"Both sides should be congratulated because they permitted me to pressure them to accept this experiment," Edelstein said.

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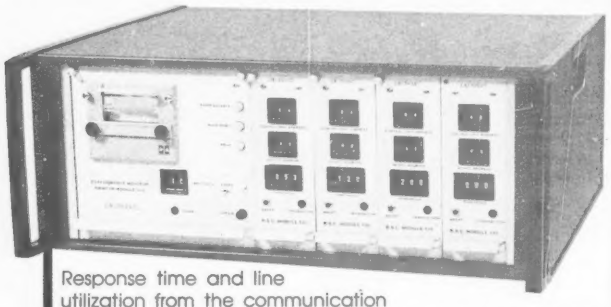

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Exemption Lifts Ceiling On Some DPers' Raises

(Continued from Page 1)

switched jobs rather than stay at one company, which adds to the recruitment problems facing firms.

The push for the exemption was spearheaded by the American Electronics Association's (AEA) special Wage/Price Task Force. Spurred by the acute labor shortages in high-technology industries, Roy J. Brandt, vice-president of human relations at National Semiconductor Corp. and chairman of the 10-member task force, recently met with Barry Bosworth, director of the Council for Wage and Price Stability.

At that meeting, the AEA presented Bosworth with specific proposals for the exemptions.

After narrowing down the AEA's proposals to the labor shortage issue, Bosworth charged the task force with drafting an exemption regulation. The final regulation, passed Dec. 12, incorporates most of the AEA's recommendations, an association spokesman said.

Although the exemption was prompted by AEA concerns, the regulation does not restrict the pinpointing of labor shortages to the electronics industry. Jobs eligible for exemptions will be developed as shortages are discovered, the AEA spokesman explained.

The procedures for administering the exemption program have not yet been determined. However, companies with personnel shortages that meet the labor shortage criteria can make direct inquiries to the Council on Wage and Price Stability.

Other DP-Tied Bills to Resurface

Privacy Emphasis Expected in 96th Congress

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Several pieces of legislation of great interest to the DP community died as the 95th Congress ended its legislative session in October.

Although some of those bills, covering such topics as computer crime, transborder data flow and telecommunications, are expected to be reintroduced next month, early in the 96th Congress, privacy will probably be the main information policy thrust of the new Congress. Indeed, the 96th Congress is already being referred to here as "the privacy Congress."

Although almost 200 bills addressing the privacy issue were introduced in the last congressional session, little legislation in this area made it to the President's desk — with the notable exception of the Right to Financial Privacy Act [CW, Oct. 23].

The Administration and several influential members of Congress hope to amend that shortcoming in the next two years. The President's "privacy initiative" — an attempt to pass into law recommendations of the Privacy Protection Study Commission — has already identified several privacy topics the President wants Congress to address.

Preyer's Effort

As a result of the initiative, the Administration will reportedly recommend legislation covering medical, insurance and credit records privacy [CW, Dec. 11]. In addition, Rep. Richardson Preyer (D-N.C.), chairman of the House Subcommittee on Government Information and Individual Rights, said his committee will most likely address similar elements of the privacy issue.

In a recent interview on "What's the Issue?" — a radio show produced by the Chamber of Commerce of the United States — Preyer said the Omnibus Right to Privacy Act he introduced in the last session of Congress [CW, Nov. 21, 1977] was "introduced for discussion purposes" and "is not the proper legislative vehicle."

The bill, which incorporated a dozen pieces of legislation introduced as a result of the privacy commission's final report, is "too complex" and "too long" to adequately solve the privacy problems identified in that report, Preyer said.

"What will happen," he theorized, "is we will be breaking off individual pieces of it," and he mentioned medical and insurance company records as possible targets for separate bills.

Communications Act Rewrite

A major piece of legislation of interest to the DP and telecommunications industries is the Communications Act of 1978, which was introduced in the House last June by Rep. Lionel Van Deerlin (D-Calif.) and in the Senate by Ernest F. Hollings (D-S.C.)

Hearings were held through the summer on the bill, which would amount to a full rewrite of the Communications Act of 1934. The legislation is now undergoing revision in preparation for its reintroduction, expected by early February, according to a spokesman for the House Subcommittee on Communications, of which Van Deerlin is chairman.

Another bill of interest to the DP community is the Federal Computer Systems Protection Act, introduced in June 1977 by Sen. Abraham Ribicoff (D-Conn.). Only a few days of hearings have been held on the measure, but it has the endorsement of several influential senators, including Charles H. Percy (R-Ill.), Henry M. Jackson (D-Wash.) and Edward M. Kennedy (D-Mass.).

The bill, strongly supported on the House side by representatives Charles Rose (D-N.C.) and Robert F. Drinan (D-Mass.), would make it a crime to misuse the computer systems of the federal government, certain financial institutions and other entities involved in interstate commerce.

Review & Forecast

Punishment for such offenses would be up to 15 years in prison, $50,000 in fines or both. The bill will be reintroduced in both houses early next year with "minor revisions" suggested by the Justice Department, according to a member of Ribicoff's staff.

On the international scene, observers here expect Rep. Barry M. Goldwater Jr. (R-Calif.) to reintroduce, early in the next session, his resolution calling for the President to convene an International Conference on Communications and Information [CW, Oct. 16].

The new Congress is also expected to take up the question of whether the U.S. Postal Service should be involved in electronic mail. Other bills that DP industry representatives hope to see reintroduced include legislation to extend copyright protection to semiconductor chip designs and a bill to extend the criminal code to define "property" as including software and computer data.

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Heavy EFT Traffic, Related Crime in '78 Stimulate Concern Over Bank's Security

By Brad Schultz
CW Staff

While electronic funds transfer (EFT) traffic mounted steadily through 1978, a rash of large dollar EFT crimes during the year fueled criticism that bankers don't appreciate how vulnerable computerized financial networks are to abuse.

Congress found that EFT "provides the potential for substantial benefits to consumers. However, because of the unique characteristics of such systems, the application of existing consumer protection legislation is unclear, leaving the rights and liabilities of consumers, financial institutions and intermediaries in [EFT] undefined."

Basic Framework Set

This conclusion in the recently signed EFT Act — an amendment to the Consumer Credit Protection Act — sets the "basic framework establishing the rights, liabilities and responsibilities of participants in [EFT] systems" [CW, Oct. 23].

The act directs the Federal Reserve System's Board of Governors to propose EFT regulations to Congress, regularly assess the economic impact of EFT, oversee the rights of EFT consumers and consult with such agencies as the Treasury Department's Comptroller of the Currency in preparing for the "continuing evolution" of EFT services and technology.

In effect, the act recognizes the board as the single source of federal EFT policy direction.

Act's Stipulations

Bankers must clarify the terms and conditions of EFT transactions to the consumer, according to the act, and banks are responsible for keeping consumers informed of any changes in these provisions.

Furthermore, the act requires documentation of all EFT transactions and prescribes a procedure for resolving EFT processing and transmission errors. It also defines the liability of banks and consumers in cases of unauthorized EFT and sets forth penalties for criminal abuse.

Finally, the act forbids "compulsory use" of EFT. No public agency or private firm may now refuse to extend credit or withhold employment or government benefits because an individual declined to receive EFT payment.

Fedwire Link

Last spring, the Justice Department objected to the Federal Reseve Board's plans to create a nationwide link of automated clearinghouse (ACH) via the Federal Reserve Communications System (Fedwire). The department termed the plans "an unwarranted intrusion into an area of developing technology that should be left to the private sector."

However, Justice did approve EFT between Federal Reserve Banks through the Bankwire network [CW, April 24]. Several months later, the board announced completion of a Fedwire link of 35 regional ACH serving about 9,400 commercial banks, 1,500 thrift institutions and 6,000 customer corporations affiliated with ACH associations [CW, Oct. 23].

Bankwire II, the successor to the original Bankwire service, was announced in August. Typically handling daily transactions in excess of $20 billion now, the private-line network includes two computerized message-switching centers. Redundant mainframes are at two sites and programmable channel termination groups act as remote concentrators for 48 communications lines [CW, Sept. 4].

Review & Forecast

Use of the federal Data Encryption Standard (DES) "as a security element in the encoding of magnetic stripes on bank cards" was formally endorsed by the American Bankers Association (ABA) earlier this month.

Security Technique

The endorsement means that banks are encouraged to use DES as a security technique, the ABA explained. The standard was said to offer the "best combination of security and ease of implementation known at this time for an electronic transaction interchange environment."

Developed by IBM and approved last year by the National Bureau of Standards, the DES algorithm is central to data security products introduced by several vendors this year [CW, Jan. 9].

Encryption entails electronic "scrambling" of sensitive data prior to transmission and unscrambling upon reception by an authorized party; thus, data intercepted en route is rendered incomprehensible. EFT applications are generally considered the most pressing market area for encryption vendors.

Controversy Raged

A controversy surrounding IBM's algorithm — critics claim it can be broken [CW, Jan. 30] — raged throughout 1978 but did not deter IBM, the Government Electronics Division of Motorola, Inc. and other vendors from trying to sell DES products to help ensure EFT network security.

For example, Motorola recently closed a deal with the Institutional Group Information Corp., a consortium representing the DP interests of 12 mutual savings banks in the metropolitan New York area, to install its Infoguard family of DES products in conjunction with a Burroughs Corp. B6700 fail-soft CPU. The equipment will safeguard deposit accounting transactions in an on-line, real-time environment.

'Stark Terror' Needed

At the recent Association for Computing Machinery (ACM) annual convention, ACM President Daniel McCracken remarked that more "stark terror" may be needed before U.S. bankers appreciate how vulnerable EFT networks are to abuse.

McCracken and others at a session that probed whether EFT is "moving too fast" for some declared that most bankers are ignorant or apathetic about encryption and security of the physical DP node in an EFT network [CW, Dec. 18].

Fedwire and the California-based Security Pacific Bank experienced two breaches of EFT security this year. This summer, an attempted embezzlement of $140,000 was reported [CW, Aug. 14] that involved impersonation and misuse of a Fedwire identification code.

During November, the year's most notorious computer crime occurred. In another Fedwire-related case, a self-employed computer consultant, Stanley Mark Rifkin, allegedly negotiated a $10.2 million heist from a Security Pacific branch and then purchased diamonds in Switzerland [CW, Nov. 13]. Rifkin has pleaded not guilty and is awaiting trial [CW, Dec. 18].

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Federal DP Acquisition Ills Headed for Cure?

By Brad Schultz
CW Staff

This year, charges of incompetence and outright corruption have surrounded the federal mechanism for acquiring computer systems. In the words of one congressional committee, a DP "policy vacuum" has been identified in the government.

But in the last weeks of 1978, top officials of the two agencies charged with directing DP acquisitions — the General Services Administration (GSA) and the Office of Management and Budget (OMB) — have announced what constitutes a massive drive to fill the vacuum.

The drive is aimed at narrowing the cycle time for procurements; obtaining a fuller appreciation of total systems lifetime costs, organizational impacts and privacy issues; and achieving a closer fit of benchmarks to user wants. In addition, the agencies hope to more closely align government expertise and resources with the state of the art largely established by industry and academia.

According to a congressional report, about 80% of the federal computer systems are at least six years old because bureaucratic "red tape" has imposed a typical procurement cycle time of three to four years for a major system. "The present [average] cycle indicates guaranteed obsolescence," the report charged [CW, Aug. 21].

GSA has responded by decentralizing procurement authority. This year, the agency relinquished control of any DP purchase of less than $300,000; the "threshold for blanket delegation" had been $100,000.

On Sept. 8, 1979 the threshold will be $1 million (see article on Page 53). Most single computer system purchases by federal agencies will thus be allowed to forego GSA clearance, shortening the time between start of the search for a contractor and eventual implementation of that contractor's system.

Leadership Role by OMB

The stinging rain of criticism that fell this year on many who manage federal DP departments — or the agencies those departments serve — has evidently prompted OMB to take a leadership role in federal DP acquisitions policy-making.

The general government team of the President's DP reorganization project — established by OMB last year to recommend ways of improving federal DP —effectively told President Carter to put "Management" back in the agency's name. The team concluded that "the absence of consistent management practices in the federal government is the major cause of the problems with information resources" [CW, June 26].

Though congressional investigators called OMB "ineffectual, producing no policy guidance whatsoever," the same investigators and the House of Representatives Appropriations Committee agreed that OMB should be made the solitary policy director on federal DP acquisitions [CW, Sept. 4].

In response, OMB has revised several of its circulars pertaining to acquisitions, and it plans, by next August, to consolidate into a single system the 851 "regulatory systems" that currently befuddle vendors. The present "thicket" of rules, regulations and guidelines discriminates against smaller would-be contractors by entailing a need for expensive sales consultants, an OMB official explained (see story on Page 12).

Early in 1978, OMB revealed plans to form a central computerized system to monitor federal contracts. Such a system already helps the Department of Defense (DOD) keep track of its 70% share of federal purchasing; reportedly for this reason, DOD was chosen to devise and maintain the planned facility for as many as 80 civilian agencies [CW, March 20].

Pentagon Criticized

The reorganization project's national security team roasted the Pentagon for waste, inefficiency and unreliability which, the team said, is rampant in military DP sections as a result of insufficient accountability to a central review office and poor communication between the people buying systems and those using them.

Review & Forecast

A GAO report slammed Interior for underuse and duplication of computer resources that allegedly resulted in "lost opportunities" to save as much as $25 million during the past five years [CW, July 10].

Privacy concerns sparked a congressional look into the Federal Bureau of Investigation's (FBI) solicitation for a telecommunications system to permit the switching of criminal justice data between state and local law enforcement agencies.

GSA only authorized the FBI to request proposals for minicomputers to replace the bureau's two IBM 2703 communications controllers, a GSA spokesman maintained. The FBI was eventually directed by GSA to "return unopened" the vendor proposals it received for the "message-switch."

A GAO report on the Commerce Department's Federal Information Processing Standard (Fips) program found evidence of collusion between

(Continued on Page 8)

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Univac Extends High End of Its V77 Mini Line

(Continued from Page 1)

Univac attributed much of the V77-800's improved performance over the V77-600 to the larger system's enhanced cache memory. Integrated into the 800's CPU, the 1K-byte memory cycles in 150 nsec, more than twice as fast as the V77-600's cache, which cycles in 370 nsec, the source noted.

Megamap Standard

In addition to offering a faster memory, the V77-800 also provides Megamap, Univac's V77 memory management system, as a standard feature. With the V77-600, by contrast, Megamap was offered only as an option.

Under the memory management system, 16 independent maps divide physical memory into 1K-byte pages, which users can allocate to their programs as needed. Moreover, Megamap allows the V77-800 to address up to 2M bytes of main memory, compared with a 1M-byte maximum for the V77-600, the spokesman added.

The 600 and 800 systems also differ in the amount of writable control storage (WCS) they provide. With 12K bytes of optional WCS, the current high-end system incorporates three times more control storage than the previous high-end model, which provides only 4K bytes.

Capable of performing arithmetic and logic operations on 16-bit data and instructions, the V77-800 offers a 150 nsec machine cycle and a 600 nsec main memory cycle, the source reported. It also provides a minimum of 128K bytes of addressable storage expandable in 128K- or 256K-byte increments, which cost $5,000 and $9,000, respectively.

Software Support

Operating systems available with the V77-800 include Summit and Vortex II, which support program development languages like Cobol, Fortran IV, Ansi '77 Fortran, Pascal, RPG-II, macroassembler and microassembler. Other V77-800 software aids reportedly include Cincom Systems, Inc.'s Total data base management system and assorted communications packages that support IBM 3270, IBM Hasp remote job entry and Univac's DCA, Uniscope and Ten 04 protocols.

Among its standard hardware features, the minicomputer incorporates hardware multiply/divide, a real-time clock and power fail/restart logic plus a 6K-byte programmable read-only memory control store for sequencing processor operations. The mini also provides 600 nsec to 750 nsec error-correction memory that automatically corrects all single-bit errors and reports all double-bit errors, Univac said.

In addition to the expanded WCS, the V77-800's optional features include a 64-bit floating-point processor that performs both single- (32-bit) and double- (64-bit) precision addition, subtraction, multiplication and division.

Working with Ansi '77 Fortran, the floating-point processor is said to provide the computational speed and accuracy required by many scientific and engineering applications. It performs a typical single-precision addition, for example, in 1.65 microsec, the spokesman said.

Because all four members of the V77 line are compatible in software and peripherals, users of the models 200, 400 and 600 can upgrade their systems to the Model 800, although they must replace their CPUs to do so, he added.

In a maximum configuration, the V77-800 incorporates a 2M-byte main memory, 1.6G bytes of disk storage and 32 CRT terminals.

A configuration consisting of a 256K-byte CPU, eight asynchronous terminals, floating-point processor, 60M-byte disk unit, 300 line/min printer, 75 in./sec tape system and Summit operating software costs $135,000.

A system with a 512K-byte CPU, 16 asynchronous terminals, floating-point processor, 60M-byte disk unit, 300 line/min printer, magnetic tape unit, Summit operating system, Total data base management software, Cobol and Fortran costs $181,000.

First deliveries of the V77-800 will begin next July from Univac, which can be reached at Box 500, Blue Bell, Pa. 19422.

Itel System Backs IBM Programmers

(Continued from Page 1)

mitted queue so they can see if it is making progress or has hit a snag.

At the other end of the development process, the software enables the programmer to check out just the diagnostic messages from a compilation or assembly, with the possibility of finding enough information in that small printout to avoid the generation of a faulty program listing.

Itel pegged Prepso as something of a halfway measure compared with Maestro. The workstation in that system has to be dedicated to the development task, whereas Prepso was designed to use — indeed, share the use of — conventional terminals already in place for other DP chores.

Although Prepso can be used with its own internal communications line driver, an interface to IBM's Customer Information Control System (CICS) is also available, enabling installations to utilize the Itel software directly on terminal networks based on CICS for the organization's application work.

Response times under Prepso "have proven significantly better" than times registered under IBM's Time Sharing Option (TSO), the spokesman said. A beta test site, using Prepso and CICS, ran its transmissions over land lines and a satellite link at 4,800 bit/sec and experienced response times of 3 to 5 seconds despite the 170,000-mile round trip, according to Itel.

The functions of Prepso are invoked by English language-style commands that are grouped by the tasks they perform. These include job submission and retrieval, session management, data set manipulation, retrieval of status information and basic communication with the system.

Noting that Prepso can work, at least locally, with IBM 3277-2 CRT terminals or their equivalents, the spokesman said the user has full screen editing, scrolling and break facilities in addition to a tabbing function, full screen roll and input prompting.

Supplementing its capabilities in support of program development and testing in the environments best suited for each of those operations, Prepso can also be used to create and maintain documentation for the system it helps spawn or any others the site wants to support in this indirect way, the spokesman continued.

Prepso requires direct access storage devices (Dasd), but can work with any such units supported by the operating system under which it is functioning, he added.

The package is available on a perpetual license agreement for $24,000. First customer deliveries of the system are scheduled for January, Itel said from One Embarcadero Center, San Francisco, Calif. 94111.

Cure Ahead for Federal DP?

(Continued from Page 6)

the National Bureau of Standards (NBS) and vendors that may have biased the awarding of Fips-development contracts to certain firms [CW, Jan. 3].

"Federal agencies have become locked into suppliers of computers and services either because certain essential [DP] standards have not been developed or agencies are not complying with existing standards," a draft of the report stated.

GAO concluded that more than $500 million has been lost annually because of the Fips program's inadequacies. For example, the lack of a hardware I/O interface standard was blamed for a loss exceeding $100 million in 1969 and "much more" last year by forcing the government to procure on a noncompetitive basis.

The GAO's harshest criticism went to the NBS' Institute for Computer Sciences and Technology, which, after 12 years of operation, had allegedly produced standards in only 15 of 65 areas originally slated for standarization. The report indicated that a more realistic estimate of this need is 120 areas.

An OMB official recently expressed rekindled faith in the Fips program and noted that OMB will hold federal agencies accountable for Fips compliance through regular review [CW, Dec. 18].

This year also featured the federal government's consideration of "architecture-specific" requests for proposal as a means of stimulating competition by extending bidding eligibility to vendors able to emulate specified mainframe prototypes through firmware.

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'Office of the Future' By 1990s

DDP: Step Toward Users' Economic Freedom

By Marcia Blumenthal
CW Staff

PALM BEACH, Fla. — Large DP centers are "turning out to be economic straitjackets" and distributed data processing (DDP) is just the first step in technological advances that will release those bonds, one analyst has predicted.

DDP will increase management's productivity and change the way business is structured, according to Harvey L. Poppel, senior vice-president of Booz, Allen & Hamilton, Inc.

Those advances will occur at a revolutionary pace that will make interactive workstations common by the mid-1980s and the "office of the future" a reality by the 1990s.

Poppel told executives attending the winter meeting of the Computer & Communications Industry Association (CCIA) here recently that managerial efficiency could be increased 10% to 25% using new applications of information technology.

The relaxed turn-of-the century atmosphere of the meeting site, the Breakers resort — with its vaulted ceilings painted with Victorian cherubs, its potted palms and with strains of violin music floating through corridors lined with long, wide wicker furniture — made Poppel's futuristic view seem even more dramatic.

Four Major Technologies

Information technology is one of the four major technologies, Poppel said, yet applications of that technology have lagged behind applications for the other three — materials production, life support and energy.

Major breakthroughs in those technologies have been occurring since the Industrial Revolution, whereas advances in information science have only been developed since World War II, Poppel maintained.

While other technologies have evolved past machine-age stages, Poppel compared the large DP center to machine-age mentality. Distributed processing represents the "first clear break with the machine age" for information technology, he added.

Until now, the benefits of information technology in the business world have been confined to tasks such as payroll, Poppel said. But the future will bring a revolution in which DP capabilities will be at management's fingertips for decision-making and for the development of decision-making models, Poppel maintained.

Corporate strategies such as competitive positioning and return on investment will be developed through interactive computer applications, with managerial productivity a major result, Poppel said.

Pointing to a study by Henry Mintzberg which distinguishes the characteristics of a manager's work, Poppel noted that 70% of a manager's time is spent in communications activities.

Mintzberg found that managers spend 35% to 40% of their time in meetings, 25% to 30% reviewing records and reports and corresponding, 5% to 15% on the telephone and 5% to 10% on travel.

"The trick is to increase a manager's efficiency in performing these communications activities, leaving more time for analysis," Poppel explained.

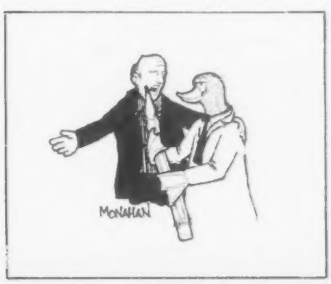
Managerial efficiency can result in a new organizational design in which fewer intermediate offices and flatter hierarchies may prevail. "Intermediate layers of management are generally for filtering communications down through the ranks," Poppel said.

By avoiding these layers, managers will require fewer employees, thus keeping inflationary labor costs in check. Mailing cost reductions and energy savings by avoiding excessive paper use and unnecessary travel are other benefits business will derive.

If communications technologies such as electronic mail and teleconferencing are accepted within a firm, organizational designs of companies will begin to change during the 1980s, Poppel predicted.

But there are obstacles. The gap between corporate planners demanding handy access to equipment and data and systems managers opposing with "sunken costs arguments" must be closed, Poppel said. Systems personnel are not yet business-oriented, a situation that will change, Poppel said, pointing to the efforts of one large company actively looking for MBA graduates to do corporate planning using informations systems.

Also to be contended with is the probable backlash resulting from the unionization of white collar workers, he said.



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Will Help Only If User Has Goal

Change in IBM Attitude on CPE Efforts Cited

By Don Leavitt
CW Staff

SAN FRANCISCO — IBM seems to have changed its attitude in the past six months about working with user installations on computer performance management projects, according to Thomas E. Bell.

A long-time computer performance evaluation (CPE) consultant now with the Singer Co., Bell told a tutorial session at the recent Computer Measurement Group (CMG) here that IBM personnel are demanding more user input.

If a user can't answer the question "What do you want?" in specific terms, IBM is now likely to point out that it can't really help, despite its various tools and technicians, he warned.

Bell made the comment to emphasize his contention that computer performance management can only be effective if its goals are expressed in user-accepted objectives with control limits, rather than in the traditional, "process-oriented" measures of traditional CPE.

Turnaround time or response time is much more difficult to define than a degree of CPU utilization, but that's what is needed for the user to know whether he is getting the service level he wants. If he thinks he isn't and asks IBM to help "improve his performance," the vendor is very likely to ask him what he specifically wants out of the system, Bell said.

Realistic Target

Whatever objective is selected as the performance criterion, the target value should be realistic, Bell continued. It obviously does no good to set it too low but, on the other hand, a target that is so generous that it can't be exceeded "isn't really any good either," he noted.

However, once a target turnaround time, for example, is set, it has to be a reasonable service level: 95% of all jobs to be turned around in three hours, for instance.

Recognizing that a certain amount of variety is part of any system, the user must then set bounds on what he will accept as being within normal expectations, Bell said. After that, only incidents that fall outside the control limits need be of any concern to the manager or his CPE personnel.

Setting both the target value and the control limits must involve the users who will be affected by the system's performance. And the involvement must be intelligent, Bell warned, noting that puts a real burden on the DP staff to educate the user on what he can reasonably expect or what he honestly needs in support.

It's not enought to simply ask the user what kind of turnaround time he wants unless the user understands how his answer might truly impact his own operations or the rest of the organization.

Observe the User

If performance management is being applied to current operations, Bell said, one of the best ways to determine what is satisfactory response time for a terminal user is to "just get in the user department and observe what happens."

The DPer should note when an operator appears frustrated by response time and, either with a stopwatch or by analyzing job-accounting records, find out the length of the unsatisfactory response time and what caused it.

For applications still in development, there is no such simple approach; it has to be the best estimate of what will be tolerable when the system is fully loaded. If a system is built with that target, however, it may react too quickly in the early stages of live use.

That, too, can be disconcerting and misleading for the future, when such fast responses won't be possible, Bell said. To avoid that problem, he suggested building in a time-delay loop to slow the lightly loaded system and then taking out the loop as the load, with its natural delays, increases.

Saltman Wins NBS Award

GAITHERSBURG, Md. — Roy G. Saltman, a computer specialist at the Commerce Department's National Bureau of Standards (NBS), received the Edward Uhler Condon Award at the Sixth Annual NBS Awards Ceremony held at bureau headquarters here recently.

The award, which includes $1,000 and an engraved plaque, recognizes distinguished achievement in scientific writing. It is named for the former NBS director who was internationally known for his contributions to scientific and technical literature.

Acclaimed for Excellence

Saltman won the award for a report entitled "Copyright in Computer-Readable Works: Policy Impacts of Technological Change," which has been "highly acclaimed for its technical excellence," according to an NBS spokesman.

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PRODUCTS FOR PERFORMANCE

Government Seen Working to Better DP Policy

By Brad Schultz
CW Staff

WASHINGTON, D.C. — The Carter Administration is seeking to promote computing research and development, boost competition within the computer industry and better align federal government DP practices with the latest commercial technology.

That message from Lester M. Fettig, administrator of federal procurement policy with the Office of Management and Budget (OMB), was delivered at the 1978 Association for Computing Machinery (ACM) convention here recently. This was seen as further evidence that President Carter's proclaimed assault on federal waste and underproductivity will be spearheaded by his Administration's corps of DP managers and professionals.

Immediately following Fettig at the podium, another top OMB official said more funds and extended responsibilities await federal DPers in 1979 [CW, Dec. 18].

At another session of the conference, National Science Foundation director Daniel C. Atkinson declared that the Administration wants more federal funds committed to computing R&D [CW, Dec. 11].

To provide computing personnel with better tools, the Administration is simplifying and consolidating its DP procurement policy, Fettig said. For example, it is changing the policy's language. The OMB now prefers that the process by which a government agency obtains a computer system be called an "acquisition" rather than a "procurement."

According to Fettig, systems purchasing staffs have failed to appreciate certain notions captured by the first term but missed by the second — including system life cycle and implied costs, such as for software conversion.

New Year's Resolution

Fettig suggested that, from the policy standpoint, OMB's foremost New Year's resolution is to simplify and consolidate the hundreds of *acquisition* rules, regulations and guidelines that have — by their sheer number, complexity and occasional contradictions — discouraged many vendors from entering federal bidding.

"Small businesses shouldn't need a government sales consultant to guide them through the thicket," Fettig remarked, indicating that the need for these experts works to the advantage of better funded organizations.

So the thicket will be pruned. By next August, a single "regulatory system" will replace 851 such systems currently imposed, the administrator announced.

Not only will the government foster more competition for its contracts, but more contracts will be available in the DP area, Fettig said. OMB will encourage government agencies to hire private firms to develop systems, rather than attempt to develop these systems in-house, he added.

Although the government prodded business into advancing technology during the 1950s and early 1960s, the government trails the state of the art today in many areas of technology, and business is prodding government to erase this lag, Fettig observed.

The government does have an obsolescence problem brought about by outmoded design specifications in its requests for proposals and acquisition cycle times that sometimes exceed a generation of technology, he told the session.

Earlier this year, the U.S. House of Representatives Appropriations Committee noted that, according to a poll of "major computer vendors," about 80% of federal computer systems are at least six years old, with the remaining 20% more than three years old.

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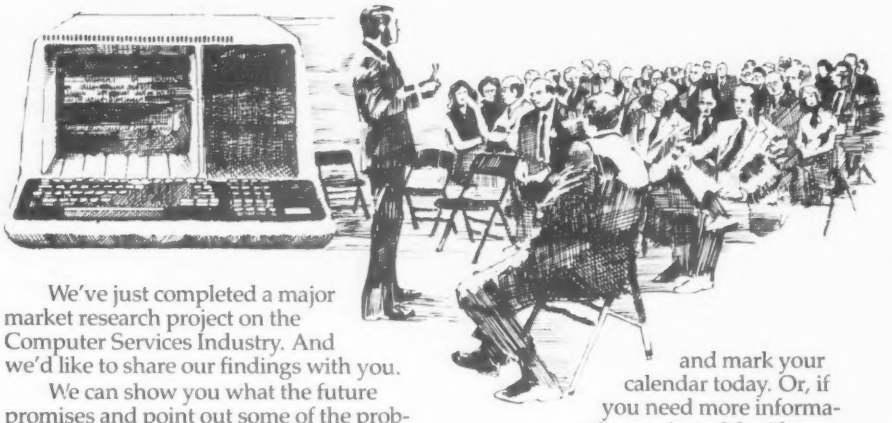

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At Center of Tape Controversy

IBM's 'Stretch' Subject of Courtroom Debate

By Connie Winkler
CW Staff

NEW YORK — The U.S. vs. IBM antitrust trial had its own tape controversy recently — not over a gap but over the technological success, or financial fiasco, of the Stretch computer in the early 1960s.

The Stretch was an early scientific machine that came between the IBM 701 and the 1401 and which became the IBM 7030.

The tape controversy developed unexpectedly last week when IBM counsel Paul C. Saunders wanted to introduce a tape recording of IBM Chairman Thomas J. Watson Jr.'s speech at the annual IBM technical awards dinner in 1966. The tape included Watson's statements about Stretch, Saunders said.

IBM witness Stephen W. Dunwell testified that at the dinner, Watson publicly apologized to him for cutting the price of the commercially available Stretch, the IBM 7030, from $13.5 million to $8 million. The cut came in 1961, not long after the first machines were delivered to the Atomic Energy Commission (AEC) and the National Security Agency (NSA).

Because of cost and delivery date overruns, Dunwell was much criticized for his business management of the Stretch project and was demoted to a position in the research lab. In 1966, however, he was named an IBM fellow, a distinguished research position within IBM.

Saunders played the Watson tape from the IBM archives and argued that it was an accurate and admissible statement of Watson's beliefs about Stretch and Dunwell. The government objected that Watson's remarks were made in a "gold watch" environment and therefore were untrustworthy.

After both sides spent most of a day listening to and arguing about the tape, Judge David N. Edelstein ruled it was hearsay and could not be admitted.

Dunwell was apparently called to testify to the technological superiority and scientific breakthroughs of IBM's early computers.

However, the government introduced many documents that suggested the Stretch's success was exaggerated. IBM lost $22 million between 1956 and 1961 on the first Stretch machines for the AEC and NSA, one internal memo said.

Another memo written by one of the Stretch team called the project a "financial fiasco."

The price cut came after the AEC complained it was getting too little performance for too high a price. And, although it was originally predicted that 37 Stretch machines would be sold, fewer than 10 actually were.

Dunwell's Stance

Dunwell contended throughout his three days on the stand that the Stretch project was a success. "Stretch was a very successful project [and this is] confirmed by the fact that the product line included components from Stretch," he said. "Customers used the machines for many years."

Dunwell, who worked for IBM from 1934-1975, called the Stretch computer a "pacesetter" which was heralded in the trade press for five years thereafter. (The government introduced memos, however, to show that much of that publicity was generated in the trade press by IBM itself.)

Stretch included major innovations in transistor technology, computer architecture and automatic error correction, Dunwell said. About the time the highly successful IBM 360 was announced, Dunwell wrote to Watson that 22 features developed in the Stretch machine were included in various 360 models.

The Stretch project set a goal for itself to exceed the computing power of any existing computer by 100 times. IBM memos contend that that goal was without basis and probably too ambitious.

"Our mission was to produce the world's best computer at that time," the retired IBM engineer said. Working with him on Stretch were foremost computer engineers including Gene Amdahl, considered the father of the 360 and now chairman of Amdahl Corp.

Dunwell also testified that he saw no difference between scientific computing and business DP and that he had not been prompted in that testimony. While IBM has contended that there is no difference between commercial and scientific computers, the government argues that the market can be so divided. Stretch is generally considered a scientific computer.

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Exchange of Programs With Soviets Debated

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — U.S. boycotts of scientific exchange programs with the USSR have been hotly contested in this country over the past few years, and those debates will continue if a recent discussion here was any indication.

"The way you get a message to the Soviet Union is by hitting it over the head," Dr. Herbert R.J. Grosch said at a session on "Social Responsibilities and Scientific Freedom" at the recent annual meeting of the Association for Computing Machinery (ACM). Grosch is a former president of ACM.

The discussion featured Valentin Turchin, a Russian computer scientist who was allowed to emigrate to the U.S. and is now associated with New York University. Turchin contended boycotts are the only way the U.S. can show it is serious about human rights. ACM activity on his behalf kept him from being arrested by the Soviet authorities for his "dissident" activities.

Opposing View

The Grosch and Turchin views were strongly opposed by Robert Parslow of the UK's Brunel University. "I don't think actually making a boycott is effective," Parslow said. "You can't force people to change their minds. You can't hold a gun against their heads and tell them to think differently.

"Quite often the object of the [boycott] exercise is to make the people who are doing it feel good," Parslow declared. In addition, there is the possibility the activity will be counterproductive and "the row" made in the West about Soviet repression will only result in Soviet dissidents receiving worse treatment, he said.

Not only is boycotting scientific exchange programs ineffective, but it runs counter to the provisions of the ACM constitution, which calls for free and open exchange of scientific information, Parslow maintained. If the object is to change the way the Soviet government acts, it is necessary to keep open the lines of communication between the two countries, he added.

Publicity Helps

Turchin, however, countered Parslow by saying it is "an absolutely established, general law" that publicity in the West of Soviet repression eases that repression. "All the Westerners can do for dissidents is try to restrict the extreme measures" taken against them, he noted.

Boycotts won't influence the way the Soviet leaders think, but will temper the "excessive" actions they would otherwise take against dissident scientists, Turchin said. Because of the general unwillingness of Western scientists to back their protests over human rights violations with concrete actions such as boycotts, the Soviet "hard-liners" have become "rather cynical" about the outcries, he pointed out.

Anything less than a boycott is taken "as just words" by the Soviets, Turchin argued. It is necessary to let them know that any repressive action will result in some response that will really hurt.

The USSR still has the most to lose if scientific exchange programs with the West are cut off, he added.

Soviet Turnabout

Addressing Parslow's argument that boycotts are counterproductive, Turchin cited the Jackson Amendment, a move headed by Sen. Henry Jackson (D-Wash.) to tie freer trade between the U.S. and the Soviet Union to more liberalized emigration policies on the part of the Soviet government. He pointed out that although it initially resulted in fewer emigrations, that trend has recently changed.

In the face of "hard" actions, such as boycotts, the Soviets feel two pressures — the pressure of the initial public outcry and the pressure to appear unaffected by that outcry, Turchin said. Eventually, the publicity of human rights violations will soften the Soviet stance, he maintained.

The first step on the road to "liberalizing and democratizing" the USSR, he indicated, is to restrict the "rampant repression" and excessive prison terms meted out to dissidents for trivial or trumped-up violations of Soviet law. Refusing to take "major steps" to help dissidents can only encourage such repression, he said.

A central question of the debate was whether the ACM should be involved in political concerns. Grosch, who described himself as "an activist," said the association should be ready to assist scientists in any country who are victims of repression.

ACM President Daniel D. McCracken said that while ACM members will continue to act as individuals, he does not think the majority of a technical association would want its organization to become deeply enmeshed in political controversies.

Humphrey Award Accents Meet

WASHINGTON, D.C. — A posthumous special award to Sen. Hubert H. Humphrey in recognition of the former U.S. Vice-President's "dynamic, forceful and continuing leadership" toward the solution of the nation's information problems highlighted the American Society for Information Science's (Asis) 1978 awards presentation at its annual meeting here recently.

Asis' outgoing president, Audrey N. Grosch, presented the award — an engraved plaque — to Frances Howard, sister of the senator who died last January. The award citation called Humphrey the "Champion of the Information Age."

The society's 1978 Award of Merit went to Calvin N. Mooers, president of Rockford Research, Inc. of Cambridge, Mass., in recognition of his early work on digital computer systems. Mooers made the first proposal to use the Boolean operators "or," "and" and "not" to prescribe selections in retrieval machines, Asis said, and described the future importance of what are now called computer networks.

Mooers was credited with coining the term "information retrieval" in 1950. Other accomplishments include securing several patents in information retrieval and signaling, producing a text-handling language, authoring some 200 publications and forming "one of the first companies whose only concern was information."

In other Asis news, the society announced that James M. Crestos has succeeded Grosch as president and will, in turn, be succeeded by Herbert B. Landau in October 1979. Crestos is executive director of the National Federation of Abstracting and Indexing Services in Philadelphia; Landau is assistant director for information systems at the Solar Energy Research Institute in Golden, Colo.

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Miami System Spots Specials, Clues Shoppers to Best Bargains

By Ann Dooley
CW Staff

MIAMI — Shoppers here can reduce their food bills with a unique system that indicates the best buys for their money among the supermarket specials advertised each week. The automated system compares the prices of seven major supermarket chains, shows the price differences between brands and compares meal plans based on the weekly specials.

The program was developed by Mark Geigel, a nutrition expert who spent one and a half years testing and developing the system to pick the best buys from among the 85,720 grocery items.

Sponsored by several community consumer groups and conducted by the Consumer Computer Project, printouts indicating weekly price information are mailed to more than 33,000 shoppers, and countless others pick up the information at mobile units located near the major stores.

Weekly pricing data on nearly 83% of all items found in most grocery stores is listed in the system. The suggested price and descriptive information for each product are taken from raw data provided by major food manufacturers and stored on a General Automation, Inc. Model 220-based system. The basic suggested price and weekly prices are then compared.

Each week, as the seven supermarket chains advertise their weekly specials in local newspapers, project workers input the information into the GA system via Hazeltine Corp. Model 1500 terminals. The system is programmed to break down the price of each product into cost per unit and weight or volume.

The system also compares the product's price against what it sold for a week ago and a year ago and determines whether the price is above or below the average, based on the year-to-date prices.

Additionally, the system compares prices of different brands being sold within one chain by price and weight and compares one store's prices with those of other supermarkets. This run was programmed into the system even though most shoppers buy all their grocery items in one store, Geigel said.

Menu Planning

Geigel programmed the system to break down each product according to its nutritional components. The system takes the nutritional data and compares it against a standard set of 500 stored menu plans from the U.S. Department of Agriculture.

Using both sets of information, the system produces 30 menus a week, each one including meat bread, starch, beverage, dessert and a fruit.

The system is geared to select menus with ingredients corresponding to the lowest priced items of that week. In a secondary run, the system can create menus based completely on the items listed in that week's advertised specials.

The system is also programmed to determine the cost of three menu plans according to the prices of each supermarket chain so shoppers can clearly see each menu's cost.

An additional run includes all the items being offered by all the major stores. If a shopper were determined enough to pour through all the data on the printout of every item in every store, he could realize considerable savings, Geigel said.

The printout is mailed weekly to any person who requests the service. Because of funding restrictions, however, only one copy can be mailed to each shopper. The system is programmed to hit on any duplicate names and addresses.

In order to receive the printout, a shopper must indicate the size of the family, the market at which she shops and how much is spent weekly on groceries.

Also because of funding restrictions, prices for only one grocery store can be mailed to the shopper. If more extensive data is wanted, the shopper can go to any library or any of the 16 branch offices of the Community Action Agency, a Dade County social service agency, where complete copies of all the information is kept on file.

This is the first time that weekly computer printouts are part of a library's circulation material, according to Mike Schulman, executive director for the Consumer Computer Project.

Unadvertised Specials

Shoppers can also learn about unadvertised bargains by walking up to one of three roving systems which travel to different stores in the area. The remote units consist of an Apple Computer, Inc. Apple microcomputer linked to the GA CPU by phone lines, a Centronix Data Computer Corp. line printer and a Porsche automobile.

Project workers provide the information about unadvertised specials by going into the supermarkets and looking for them, then going back and entering them into the system, which is housed in the auto. The data is keyed into the Apple, which functions as a data collector, and then transmitted to the GA system, which sorts the data and feeds it back to the Apple.

Consumers can see unadvertised specials on the CRT screen or take one of the previously duplicated copies of that particular store's advertised specials. Project workers encourage shoppers to add their names to the mailing list so the prices can be mailed regularly to their homes.

(Continued on Page 16)

Thieves Make Off With 'Best Buy' Programs

MIAMI — Thieves broke into the headquarters of the Consumer Computer Project recently, stealing programs necessary to the operation of the successful grocery "best-buy" project.

Miami police called in to investigate the crime said the theft was committed by professionals who "knew exactly what they were doing."

In the process of installing additional security devices to protect the equipment and remaining software, electronic bugging equipment was discovered in the computer area. An investigator for the Federal Bureau of Investigation was called in and has since supervised the investigation.

Taken from the secured headquarters building were several 20M-byte control disks containing programs for trend analysis of the weekly and week-to-date prices for the grocery products. Both the original disk programs and the backup disks were taken.

Printouts Missing, Too

Also missing is a printout listing the prices of products and the Consumer Basic manual which, according to project spokesman Alan Johnson, was "more disturbing than the rest since someone can use the manual to interpret the program." The loss was estimated at $100,000.

The program is of no use to anyone else; if someone tried copying the program, he could be stopped on legal grounds, so it seems as though someone definitely wants to stop the project, Johnson said.

In the meantime, 50 volunteers are being brought in to keypunch the material to re-create the missing programs. Project workers hope to have the missing data back on-line in two to three weeks.

Additional CPU and peripheral equipment from General Automation is being donated to the project in order to keep up with the steadily growing demand for the pricing information. The recent burglary has also aroused more interest in the project.

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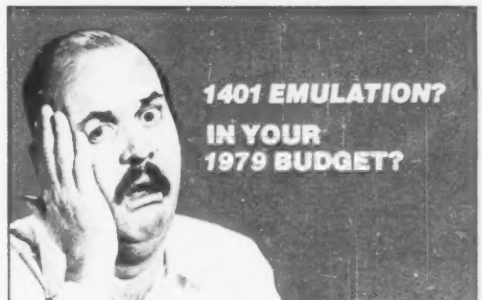

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How Much Do You Know About EFT Status?

WASHINGTON, D.C. — The following "true or false" quiz, composed by George C. White, a Chase Manhattan Bank vice-president, was passed to those attending the session addressed to electronic funds transfer (EFT) at the Association for Computing Machinery's annual meeting, held here recently.

How do you measure up? Answers are given on Page 17 of this issue.

True or False

1. Checks continue to account for the largest dollar amount of funds transfers, even with the widespread publicity about EFT.

2. An electronic alternative must be found for the continuing increase in check volume, now estimated at over 30 billion annually.

3. EFT is advancing now with the issuance in October 1977 of the National Commission on EFT's final report, as well as the passage of the Financial Institutions Regulatory Act [CW, Oct. 23].

4. EFT would advance more rapidly if each consumer could be assigned a single identification number, such as a Social Security number for individuals or a Dun's number for corporations.

5. Consumers have to be educated to give up control (and float) in the initiation of their payments in an EFT environment.

6. Consumer advocates are helping to educate consumers about EFT transactions.

7. Older persons — retired individuals, for example — appear to be reluctant to use EFT capabilities.

8. Financial institutions are now issuing both Master Charge and Visa cards because of customer pressure.

9. Bill payments by telephone represent a new aspect of EFT.

10. EFT services are too new to have yet effected shifts in market share.

11. Automated clearinghouses (ACH) exclude point-of-sale — for example, cash-dispensing — transactions.

12. ACHs offer faster funds settlement than the present check environment.

13. ACHs are restricted to low-value transactions.

14. Money transfer networks — such as Fedwire, Chips, Bankwire and Swift — are expected to convert to common message formats in the 1980s.

15. One of the primary advantages of Swift is funds settlement in foreign currencies.

System Rates Food Bargains

(Continued from Page 15)

The complete system includes the GA 220 system with 64K bytes of memory, eight transmission lines of RS-232-compatible controllers, 10M bytes of disk, several Hazeltine 1500 terminals, a specially designed Basic operating system and an Isam filing system with formatted output routines.

Also included are a Terminet, Inc. Series 300 line printer and several Centronix printers, which are located in the mobile units along with the 48K-byte Apple microcomputer and high-speed serial interfaces. The total system also includes two disk drives and two minifloppies and the three donated autos, Geigel said.

GA equipment was selected over Digital Equipment Corp. and Hewlett-Packard Co. products because it suited the project's needs most closely, according to Geigel. The Apple system was chosen because it could operate well in a mobile situation, he noted.

Although the program has only been in full operation for several weeks, there have been no breakdowns or problems, he said. Fail-safe codes were put into the system so that if any errors occurred during data input, the system would flag them.

So far the response to the project has been very positive, according to Schulman. Surprisingly few shoppers have complained they experienced any problems in reading the printout, he said.

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Based on U.S. Mini

Soviet Group Using 'Dialogue Payroll System'

By Marcy Rosenberg
CW Staff

BOSTON — A minicomputer-based interactive payroll system sounds like just another small business system application. This one, however, was developed by an engineering research institute in the USSR, a country oriented more to scientific than commercial applications.

Scientists from the Academy of Sciences Institute of Radioengineering and Electronics in Moscow described what they called a "dialogue payroll system" in a presentation at the Wang Laboratories, Inc. Sixth User Society Symposium here this month.

After a two-year development effort, researchers at the institute put together an applications package that runs on Wang hardware and Basic 2 software to automate payroll procedures in its bookeeping department.

The resulting interactive program allows operators to enter, retrieve and update resident data, as well as enter current available data, calculate all payments and taxes and print necessary documents, according to Dr. Valery V. Romanovtsev, senior researcher at the institute. Output includes a list of employees and when and how much was paid to each.

Dubbing this program development "an unusual approach for our country," Romanovtsev cited two unique requirements for its application at his organization.

First, because of a shortage of programmers, the institute required that data entry be performed by an untrained bookkeeping staff that previously used paper and small adding machines to calculate and document employee payroll. The developers met this need by putting data entry under full program control and using a "self-explainable" question/answer menu.

The institute also designed its payroll system to comply with the Soviet tax system mandate that records of payments and taxes for each employee be kept for 13 months. This information can be stored in 1K byte of disk memory per worker, Romanovtsev said.

The payroll program operates on a 32K-byte Wang 2200-VP processor, 2226B CRT terminal and 2221W printer. The institute selected Wang mainly for its Basic 2 system software.

"We wanted Basic because we are not specialists in commercial applications — our emphasis has been in scientific areas," Romanovtsev noted. Basic 2 provided "a powerful sorting statement set and a flexible file system and bit/byte manipulation.

His organization looked at other systems, including "several of Soviet origin," and at Basic systems like the Digital Equipment Corp. PDP-11 family and Hewlett-Packard Co.'s 9830 and 1000, but none provided the same combination of features as Basic 2, he said.

Don't Need Speed

While DEC and HP systems may be faster than Wang because they use a Basic compiler — as opposed to Wang's interpreter — "we didn't need the speed," Romanovtsev said. The payroll application "didn't call for much processing," but instead required "file handling and flexibility to update the program and revise it from time to time. This is easier to do with an interpreter."

The institute found its system can accommodate up to 1,000 employees, but would only require additional data entry terminals — and no program or file changes — to handle more workers.

All in all, the dialogue payroll system proved "very effective" because it simplified data preparation and reduced stress and error probability, Romanovtsev maintained.

Several other USSR government institutes, in fact, may adapt the system to their own needs, he noted. These include the Information Institute for the Coal Industry, Academy of Sciences Physical Institute and the Economical Mathematical Institute.

It is not uncommon for Soviet organizations to "freely exchange technology and lend expertise to each other," he added.

In the future, Romanovtsev hopes to get additional funding from his institute for the research team to develop other small business applications software. Plans include such areas as money transfer, inventory control and financial planning.

Quiz Answers

You may disagree, but White maintained that all of the correct answers are "false."

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Editorial

Just Wait 'Til Next Year

'Twas the year before Christmas and all through the land
The tape drives were whirring with computer thefts grand.
Though the codes and the passwords were prepared with great care,
The embezzlers and felons popped up everywhere.

While bankers and executives were snug in their beds
And visions of profits danced in their heads,
Computers and terminals and DP machines
Were covertly used for criminal means.

Commercial Trust in New Jersey received such a clatter
When a keypunch mistake made a bank account fatter.
One-tenth of a million was lost in a flash
And a simple coin dealer had that much more cash.

In Flushing, a student who knew some DP
Awarded himself a Phi Beta key.
His grades were altered so lively and quick
That his peers were amazed and the faculty sick.

Two agents in Bridgeport for the U.S. DEA
Discovered that selling drug data would pay.
An IBM mainframe was used for the crime,
And they managed to profit for quite a long time.

In Toronto, an Amdahl was used for abuse
As students put CRT screens to misuse.
And Hawthorne, California, saw funds fade away
When a Honeywell system took part in foul play.

Even NASA had its share of computer-crime men,
Stolen DP directories and breached PDP-10s.
And who can forget the Belmont affair,
When programmer and cash were suddenly not there.

In L.A., the UCB staff had a fright
When $1 million was lost overnight.
And Security Pacific had its day to rue,
When a clever programmer took 10 million-two.

Now congressmen, now senators and banks in the nation,
All struggle to enact preventive legislation.
And Abraham Ribicoff is getting his licks,
While sponsoring Senate Bill 1766.

Today, for computers with data encryption,
Total security is nothing but fiction.
And computer criminals and crooks continue to sneer,
"If we didn't get you this time, just wait 'til next year!"

— — — Tim Scannell

Data Past

Five Years Ago
Dec. 26, 1973 — Jan. 2, 1974

WHITE PLAINS, N.Y. — IBM upgraded its 3740 data entry system to include expanded arithmetic and data editing functions; stored program control for searching, updating, formatting, keyboard operations and printing; a 3717 "steel belt," engraved-font, 155 line/min printer; expanded communications including multipoint data link control; and OS/VS1 370 support for diskette input/output.

— — —

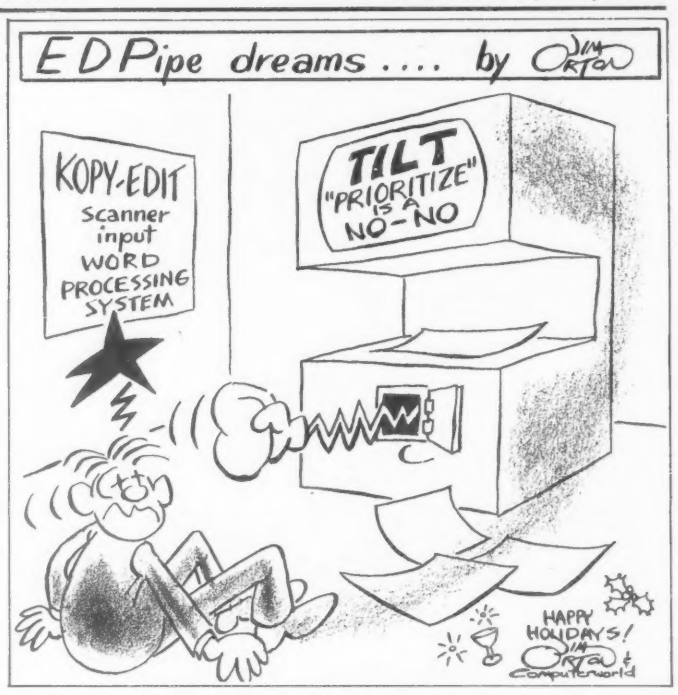
NEW YORK — The U.S. Court of Appeals here dismissed IBM's appeal of a contempt of court ruling issued in its case with the government. At issue were documents that IBM turned over to Control Data Corp. before that company settled with IBM and which IBM later claimed were turned over "inadvertently" and should have been subject to a claim of attorney-client privilege.

Eight Years Ago
Dec. 30, 1970 — Jan. 6, 1971

NASHVILLE, Tenn. — Internal Revenue Service computer tapes containing thousands of tax returns which were erased by airport radar in the spring had not been restored as of this date. A consultant revealed that inadequate grounding of metal shielding was the cause of the wipeout.

— — —

TORONTO — Canadian government officials here began work on a debtor's data bank that would provide information to anyone for $2 per search. A spokesman for the Ontario government said the data bank would be restricted to sales contracts of $300 or more, chattel mortgages and the assignment of book debts by companies.



Letters to the Editor

If in Doubt, 'Power Off'

Computerworld readers, in their extensive experiences, probably think they have heard everything, but here is something I would like to share.

I work for a medium-sized hospital in southern Connecticut. The hospital has at least one computer operator on duty from 7 a.m. until midnight and leaves the computer running but unattended for the remaining seven hours. The machine is left running because Medical Records, Admitting and the Emergency Room do on-line inquiries and updates for any admissions that may come in during the night.

Well, the other night a security guard, making his rounds at about 3 a.m., entered the computer room and noticed the computer was on. He could not understand why the machine would be on when no one was there to run it, so he notified the night nursing service supervisor, whose duty it is to handle any emergency situation that may arise. A few minutes later she entered the computer room and, after assessing the problem, called upon her vast knowledge of DP and determined that the correct course of action was to press the "power off" button on the CPU.

The power down was not discovered until 7 a.m., when the first shift operator started work.

Hank Petroskey
West Haven, Conn.

Unsupported Data Supplied

P.G. Elam recently commented on the "future DP situation" [CW, Nov. 27].

I have recently questioned a number of often-quoted statistics (see "The Ten Great Software Myths" [CW, Mar. 6, 13]) and for that reason alone must quarrel with some of the information in Elam's commentary. References were made to unidentified experts and unsupported data was presented.

I question the following:

1. *Many* organizations are now citing costs as high as $71 for a line of code that cost $6 to $7 only 10 years ago.

2. DP costs, limited to 1% to 3% of the overall corporate budget 10 years ago, have now risen to between 12% and 15% in *many* organizations.

3. One industry expert determined that up to 70% of the *average* DP budget is directed toward people costs in *some* organizations.

4. People costs as a percent of overall DP budget may go as high as 90% in 1985.

5. DP is the world's most labor-intensive industry, with the possible exception of agriculture.

All budget surveys reviewed by this observer have shown personnel expenses as a percent of total DP expenditure to be a surprisingly stable factor. While DP (in the area of programming, not hardware building) is indeed heavily labor-intensive, it is certainly not to be compared with agriculture. The latter industry is very production-oriented — and highly mechanized.

Finally, Elam concluded that DP professionals — unlike other professionals — have had salaries triple or quadruple during the last 20 years. As this rate of increase equates to a nominal 5% to 7% annual compound growth, the apparent indictment of "computing technologists" as undeserving is not justified in view of inflation.

I do agree, however, with Elam's conclusions concerning the potential economic impact of acquiring externally developed software. I am convinced that off-the-shelf software products are the most viable alternative available to DP installations in searching for productivity increases with respect to application development.

Werner L. Frank
Woodland Hills, Calif.

Commentary

Pfeiffer's Uniqueness at IBM Disturbing

By Connie Winkler
CW Staff

Jane Cahill Pfeiffer, IBM's most recent woman vice-president and one of only two in the history of the company, lauded IBM in court this month for its efforts to bring women and minorities into the pool of potential vice-presidents [CW, Dec. 18]. That pool apparently remains dry because there have been no women or minority vice-presidents out of hundreds in the corporation since Pfeiffer left in 1976.

During here court appearance in the U.S. vs. IBM antitrust trial, Pfeiffer guessed that in 1976, 11,000 out of 130,000 technical, programming and engineering IBM employees were women.

— — —

Q: Would you point to IBM's track record in the number of corporate vice-presidents who have been women as an example of IBM's dignity for the individual rights of women?

A: Yes. I think the fact that there have been one or two women along the line indicates an openness that is ahead of most in our country.

Q: One or two out of 125?

A: Yes. Many companies don't have any and have none coming up.

— — —

IBM prides itself on being better than the best and this applies to the numbers of women and minorities it recruits and employs. Further, that commitment to excellence means those women and blacks are the best individuals that can be found for the job. If anyone has the qualifications to succeed, it is these minority employees.

Yet, the disquieting fact remains that only Pfeiffer has made it to the top.

— — —

Q: But yet, as of 1978 there are no women corporate vice-presidents at IBM. Is that correct?

A: That is correct to the best of my knowledge.

Q: In addition to Ruth Leach and yourself, do you believe there were no other women in the entire IBM corporation that were as equally qualified as any of the men chosen to fill the positions of corporate vice-presidents?

A: I don't pretend to know all of the women in the IBM corporation, but of all the women I knew, I don't feel that someone should have been selected while I was there for vice-presidency, in comparison to the men who were in those jobs.

Q: So that you felt that all selections made for vice-president of the IBM corporation were on the basis of merit?

A: Yes, I did feel that and I feel that now.

Q: And the result of that selection on the merits was a zero representation of women as vice-presidents today, is that correct?

A: I would have to say that it wasn't selection of the merits, that it was the development of people and that there were no women officers. And there were no minority officers, and that is because the development process did not early enough include minorities and women, with myself perhaps as an exception.

— — —

If women and blacks are not making it to the top at IBM, then that bodes poorly for the status of minorities at other computer manufacturers and DP firms.

In fact, the situation is not unlike that of computer users as reflected in a recent nationwide survey by the National Science Foundation (NSF) Women in Science program. The survey showed the number of men employed at or above the systems analyst level far outpaced the number of women [CW, Nov. 22].

As a positive step, NSF has started a grant program to colleges for science career workshops for women on a wide spectrum of scientific disciplines including computer science and engineering. This is a program IBM has supported.

However, if Pfeiffer's experience is any indication of the status of women, then grander programs are needed to bring women and minorities through the ranks of the computer industry. The first step must be taken by the companies themselves to wipe out the discrimination that prevented such development programs in the past.

The Taylor Report

Firms Give Ingredients For Useful Public Aid

By Alan Taylor
Special to CW

Pillsbury Co., a food manufacturer, and Honeywell, Inc. are collaborating to provide the public with a useful service. Pillsbury developed the program; Honeywell supplied the data network.

Food editors for newspapers input recipes into Honeywell's network to be analyzed into nutritional components by the Pillsbury program. The results of the nutritional breakdown are made available to newspapers so readers can get recipes tailored to their nutritional needs.

The Los Angeles Times and *The Minneapolis Star* are only two of the newspapers that run the nutritional breakdowns alongside recipes in their food columns. Peggy Katalinich, food editor at *The Minneapolis Star*, talked about her efforts to get foods analyzed into nutritional components at the National Food Editors Conference held this past October.

She first brought the idea to the University of Minnesota's food and nutritional department. It had a computer program that could fulfill the task, she said, but the cost would have been $50 per recipe.

Deciding that the price tag was too high, she went to Pillsbury and told the firm how useful it would be for the public to see this nutritional information in the newspapers. She recalled that Pillsbury liked her idea and started to adapt its confidential food analysis programs to meet newspapers' specifications.

Katalinich told the conference that someone realized no provisions had been made to get the food analysis results to the newspapers. The idea of sending everything to the computer room at Pillsbury's Minneapolis headquarters wasn't too attractive.

Frantic Activity

Only a week before the food editors' conference, Pillsbury called in Honeywell's data network. It was reportedly a frantic period.

The Pillsbury programs were transferred to the network, and some file structure problems were hurriedly patched. Differences between a time-sharing service program and a scientific research program had to be ironed out.

Then everyone was ready for the food editors' presentation. And the cost per recipe had been lowered from $50 to $3.50.

Further developments are taking place. File structures are not the only difference between scientific and commercial programs. Input differs. So does the library of nutritional values and running time efficiency. I hear that all these areas are getting attention.

For example, the measures that are input are being changed from grams to more familiar measures like teaspoons. The library is be-

(Continued on Page 24)

The Human Connection

Job Agencies Breeding New Professionalism

By Jack Stone
Special to CW

Can you imagine a person with the title "vice-president, director of training" in a personnel placement firm? Could such an individual be for real?

I heard of one recently. George Whitwell is employed by Fox Morris Personnel Consultants and is responsible for the training of about 150 employees who are located in offices in 12 major U.S. cities. To allay my doubts about the legitimacy of the title, I interviewed George at his office in Wilmington, Del., and found him dedicated to his task and a fine spokesman for his industry as well.

My initial bias against personnel agencies was derived from a positively wretched experience I had with an executive recruitment agency more than two decades ago. It handled me with all the delicacy of a pickax. Seems as though it circulated hundreds of copies of my resume without my prior knowledge and approval!

Some years later, I checked into another agency that offered me the prospects of money, power, fame and fortune, if I would only fork over three grand (one-time charge). In return, it offered to paper over the seamy edges of my cantankerous personality and make me reasonably presentable to the marketplace, at least long enough to land a better job. But no, it wouldn't guarantee placement or refund the dough if I didn't hit paydirt, so I took off to see a science fiction flick instead of signing up.

My conversation with Whitwell began on a sublime note:

Q: George, what's a nice young man like you doing all mixed up with a bunch of "headhunters?"

A: Jack, as you know, in any industry, there are a few companies whose operating policies and marketing practices give the business a bad name. But the so-called "headhunters" or "body shops" are dying out.

These terms are used to describe those placements firms who are known to honor the fee first and doing a professional job for applicant and company second, if at all. Such firms have no particular desire to build proper relationships with either party and really don't care whether the employment works out as long as the money rolls in.

Q: I hadn't heard of any training activity taking place in a placement agency. Isn't this function new?

A: As far as I know, we're rather unique. We have come to the conclusion that we must have an ongoing program of staff development to give our people both the knowledge and confidence to deal with highly qualified applicants and top people at client companies. For example, we recently engaged an internationally known consultant to conduct a seminar for our DP personnel recruiters on the changing

(Continued on Page 21)

Cost-Effective DP Training a Big Challenge

J. Daniel Couger On Education

According to the only survey we have been able to locate — it came from Brandon Systems Institute, Inc. — training budgets are up 25% from last year. And since DP budgets have increased by more than 15% (*Datamation*, January 1978), the training director has a significant increase in dollars at his disposal.

What is the component of training that costs the most? Is it entry-level training, intermediate or advanced? Or is it training on technical subjects or training in other areas, such as the behavioral aspects of system implementation, personal communication or supervision? What percent of the training budget is spent for systems personnel as opposed to operations personnel?

Unfortunately, there are few answers available on these important questions. The annual salary/budget surveys by *Datamation* and *Infosystems* do not include such information.

In fact, the survey information available is highly suspect. For example, the June 1978 issue of *Infosystems* provided data on the percent of total operating budget which the DP budget comprises. For the banking/financial area, the figure reported was 2%. In July, *Bank Systems and Equipment* reported the results of an American Banking Association (ABA) survey. According to ABA, the DP budget accounts for 9.2% of total operating expense for banks with more than $500 million in deposits and 8.5% for banks in the $100 million to $500 million deposit range. Whom does one believe?

Brandon Survey Results

In the DP training area, the only survey we have been able to identify is the annual one conducted by Brandon Systems Institute, Inc. Gary Slaughter, president, was kind enough to give us the survey results. Some 98 organizations responded to the 1977-78 survey, compared with 70 the previous year. DP budgets ranged from $1,400 (!) to $35 million. The average was $1,843,000.

The training budget averages 1.5% of total DP budget, compared with 1.2% the prior year. An interesting statistic is the average budget per person — $518 this year compared with $340 last year.

How do the survey organizations allocate their training dollars? The highest percentage goes to the application programming group, as Table 1 shows. However, the per-person share is highest for DP management and the system software group.

Twenty-eight percent of the survey organizations do not train users. For the 72% that do, introductory DP courses occupy the lion's share of user training. Other subjects include project management, system analysis and how to use application systems.

However, the cost of training users is not included in DP training budgets. The users are paying for their training; DP departments are "using the proceeds to finance more DP department training," according to the Brandon report.

Job Category	Dollars Per Person	Percent of Training Budget
DP Management	889	18
System Analysts	472	16
Application Programmers	683	33
System Programmers	890	13
Operations Personnel	267	20

Table 1. Spending by Employee Category

Anticipated Growth

Some 60% of respondents believed that the training budget would grow again next year. Some 34% felt it would be status quo and 6% anticipated a cut.

The highest cost component in training is the time of the individu-

(Continued on Page 24)

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"Peugeot, producing 2.5 million vehicles a year, is now the third largest automobile maker in the world. Domestically, Peugeot needed a comprehensive data base-oriented financial reporting system that could be implemented quickly, with the least amount of impact on data processing and accounting staffs and resources.

"We did not want to 're-invent the wheel', and after a thorough review, we selected Software International's Accounts Payable software package to start. We planned to follow that with their General Ledger a year later, but since Payables went in smoothly in only 60 days, we installed the Ledger six months ahead of schedule.

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Donald K. Lane
President, Small Business System Division
Software International Corporation

New Job Title Might Help

Systems Auditor's Job Often Misunderstood

By Michael Bingle
Special to CW

Systems audit is a title that misrepresents the function of the people assigned to it. The word "systems" should remain in the title, but should the term "Audit?"

Should there be another descriptive term added to form an even more ambiguous title?

Functionally, the auditor is responsible for examination and verification of financial accounts, but this is just a small part of the job of the system auditor. He is also a programmer, systems analyst and computer technician and knows quite a bit about computer operations and security.

So, should we call him a "systems audit analyst technical operations specialist?"

More realistically, my question is this: If we perform all of the jobs I have just mentioned, then why are we called auditors? Psychologically, "auditor" is about the worst thing we could be called, since we interact primarily with DP professionals who seem to feel the term "auditor" is synonymous with some sort of deadly plague.

Actually, we are just an extension of the overall DP function — the final step, so to speak.

If one were to talk with 10 different systems audit managers, I think he would be amazed at the diversity of opinions over exactly what the systems auditor's functions should be.

Reader Commentary

It is true that many managers feel the systems auditor functions as an accountant, but then why do most companies have accounting and internal audit departments? Why not just combine all of us and save both time and redundancy in the overall workload?

I don't think that combining the departments is the answer, but I do feel that something should be done to help clarify our objectives to the average computer professional. If changing the title will help, then let's do it! Perhaps then we will be accepted as the highly specialized DP professionals that we are.

Bingle is a senior systems technician in Systems Audit with Blue Cross/Blue Shield in Newark, N.J.

Agencies Take New Approach

(Continued from Page 19)

responsibilities in management information systems (MIS).

We have 12 offices in the eastern U.S. For sessions like the one on MIS, we bring specialists from those offices to a central location — generally our main office in Philadelphia — so they can learn more about their particular area of interest.

But we've also just about completed development of a six-month training program for our new personnel. This includes classroom or "live" experience to teach them the ways we work, the impact of any pertinent government regulations and the needs — and jargon — of some of the industries we support.

Q: What does your firm do (in addition to training its staff) that qualifies it as a professional services organization?

A: We have strong beliefs in the concept of commitment. We believe that we must demonstrate clearly to all the parties involved — the client company, the applicant and the recruiter — that we are in the placement business for the long term.

Several stringent policies we have established for ourselves include, first of all, having full-time, salaried employees in branch offices owned by the firm. We don't believe in the franchising concept of personnel placement agencies because we want to maintain control over our services.

The policy further requires that we employ high-quality professionals to handle our placements and not pay them solely on straight commissions.

Another policy requires that all fees be paid by the client company and only after the placement action is consummated. Furthermore, in certain cases, if there is a premature termination of employment, we stand to lose a portion of the fee. This policy forces us to focus on effective placement and not on early fees.

To meet our business objectives, we have to perform well and produce over and over again for the client company, so that we establish enduring relationships and repeat business. We quickly learned that the way to succeed is by working hard to find the right person for the position.

Happy New Year!

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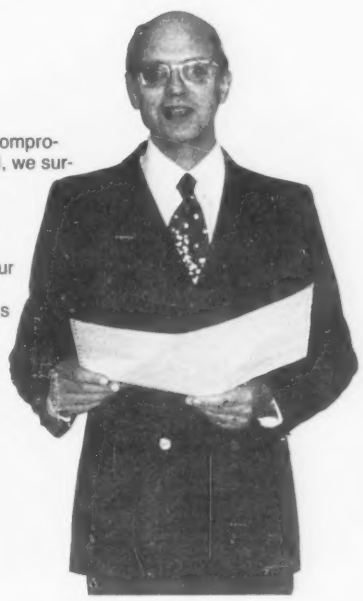

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Bernard F. Steiner
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Letters to the Editor

Lack of Women A Loss to Whom?

Having read "Lack of Women DPers Seen as 'Severe Loss' "[CW, Nov. 20], I ask, "To whom?"

The loss I see is to Women's Lib and to the business world in general.

Women's Lib suffers because it has found another area that it has not yet managed to force its way into by means of law or incrimination. The business world suffers because the energy spent dwelling on this subject could be devoted more constructively in so many other ways.

What I fail to see is the National Science Foundation and the science and engineering industry grinding to a halt because of a lack of women turning the wheels.

In some 19 to 20 years of working in DP, I have not required the assistance or encouragement of law, or a school or of Women's Lib to gain the education, opportunity or experience I have. I've advanced from input clerk to my present position as financial projects manager through interest and the desire to advance in my career in DP.

Young people today are given some insight into the area of DP at a very early age. If a young woman has the desire to seek further education and a possible career in this area, she has every opportunity to do so without the encouragement of someone who has decided that the balance between sexes is off by some wild percentage.

I strongly feel that women should be given every opportunity for education, career advancement and equal compensation, but only when they exercise the personal freedom to do so — not when someone decides they should pursue a career simply because the numbers are unequal.

I would almost bet that the number of DP-related degrees awarded is very much in line with the number of entrants to that course of study. Let's face it; nobody is forcing the women out of those degrees, it's just that there is a much higher percentage of women than men who prefer to work towards staying home eventually to raise a family.

You could major in accounting today and wait 10 years to apply what you have learned, but that would be tough to do with a concentrated effort towards an M.S. in computer sciences!

Sandi Doss

Indianapolis, Ind.

Blinded to Other Causes

To quote the Nov. 27 editorial, "Men outnumber women by more than four to one in upper echelon DP jobs . . . and the percentage of women receiving degrees in the computer sciences is even lower."

Does this imply that a higher percentage of women receiving DP degrees make it to the upper echelons than men? It seems so.

If that's the case, industry is doing better than education in encouraging and promoting women. Perhaps it is even discriminating in favor of some.

To blame every condition of man on discrimination seems to be the chief characteristic of our age. Perhaps that blinds us to some other causes which ought to be investigated and treated.

J. Jensen

Dan Diego, Calif.

Insensitive View of DPers

Please spare us any more Joan Hendrickson in the "Human Connection" column. She has all the human warmth and compassion of Louella Parsons, only she doesn't write as well or include any spicy details. Her views on the humanity or lack thereof in computer people are tedious, banal and useless, seemingly limited to gasps of distress at how cold, unemotional, unfeeling and incapable of love all us DPers are.

Being a computer person myself, and therefore ipso facto cold, unemotional and so forth, I find it hard to understand why she ticks me off so thoroughly that I am writing this letter. I have found my professional colleagues to be widely varied in personality, emotional depth and spiritual orientation.

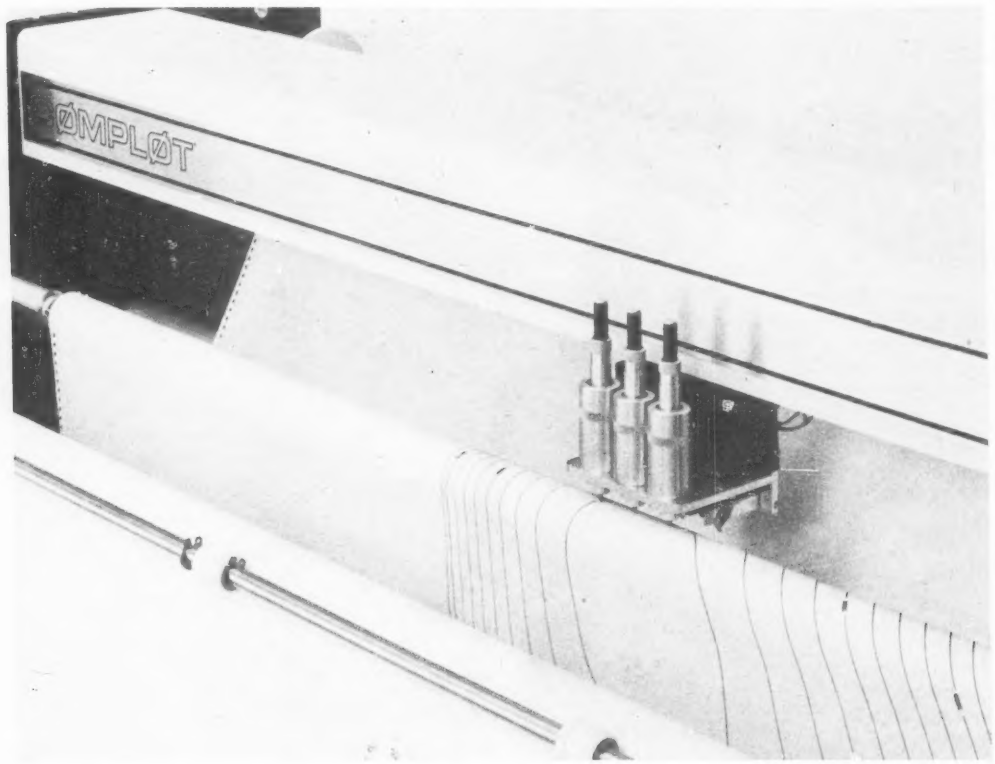
Perhaps my experience of human relations specialists has led me into the same indefensible stereotyping of which she is guilty, since I find her predictably glib and irrationally convinced that "love" means spending several hundred dollars to sit around in an artificial emotional hothouse having warm feelings toward total strangers.

Or perhaps I feel that enhanced interpersonal communication skills are important enough to all of us, both as professionals and as individual human beings, that those skills and their importance should not be trivialized and made alien by insensitive articles like Hendrickson's.

Roberta M. Taussig

Beaverton, Ore.

'This Is Terrible, I've Just Erased the Good Girls and Boys' Data Base.'



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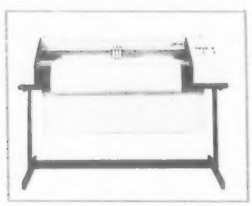

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Mumps Programmer On Zip Code Change

All these computer people fussing and fretting about the post office wanting to increase the size of the Zip Code just shows one thing: They jumped on the Cobol bandwagon and now they're paying for it.

Fixed-length fields are inefficient and hard to modify. The real world is variable-length, but simple-minded systems programmers take the easy route in operating system design and force applications programmers to pad and unpad worthless spaces in their files in order to fit into the fixed-length scheme.

Now if they were using Digital Equipment Corp.'s Ansi Standard Mumps (DSM), there would be no reason for any changes. All DSM files are maintained as variable-length, compressed fields in the self-optimizing B-tree (see Don Knuth's "Art of Computer Programming," Volume 3). Regardless of the size (to a 255-character limit), range of values or frequency of occurrences, a near-optimal access path with a disk storage efficiency of 75% (95% in static files) is guaranteed.

I have nothing to do with DEC's marketing of DSM. I am only a Mumps programmer, tired of seeing so much RSTS, RSX, OS, DOS and so on when DSM's B-tree makes them look pale in comparison.

But at Mumps' current 80% growth rate per year, I guess I can wait the few years it will be before the world finally sees the light.

Charles Volkstorf
Northboro, Mass

No Account at Irving Trust

A story in the Nov. 13 issue of *Computerworld* concerning the $10 million theft from Security Pacific National Bank stated that S.M. Rifkin, the alleged culprit, had the money deposited in his account at Irving Trust Co. To our knowledge, Rifkin has never had an account with Irving.

Letters to the Editor

The properly authenticated message from Security Pacific, relayed to Irving via the Federal Reserve Wire, instructed Irving to deposit the funds in favor of a Swiss correspondent bank.

David E. Santos
Assistant Secretary
Irving Trust Co.
New York, N.Y.

An Unfair Shake

It is not uncommon at all to see headlines bringing attention to "computer fraud" cases or "computer error" embarrassments. We in the DP industry know that the vast majority of those incidents (if not all) are not "computer" caused but very directly related to human errors.

The general public reads these headlines and another doubt is cast for the computer and its place in our environment.

Hopefully, the public will read the entire story and if people have even a small understanding of DP, they can see that it was truly man that made the error, not machine. Regretfully, however, the true source of the error is not made apparent by the writer of the story or is not understood by the reader.

I suppose all the foregoing can be attributed to nature in that it is much easier to relay blame for error to unfeeling machines than to accept it ourselves. What really bothers some of us in the DP industry, though, is the fact that when the tables are turned, where are the headlines?

The average newspaper editor apparently sees no interest in the fact that a computer uncovered a fraud or an error, or at least not nearly as much interest as in allegations that a computer caused a fraud or error.

Even our own *Computerworld* is guilty of this reporting but, thankfully, to a lesser degree. "Williams Found Guilty" [CW, Dec. 11] was a rather small and inconspicuous article compared with most articles pointing out alleged computer frauds and errors, at least it's there and that is more than we will get from the average newspaper.

However, I would rather have seen the headline read "Computer Uncovers Fraud."

Ron Mitchell
Marshall, Mich.

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Expanding Budgets Mean Bigger Challenge

(Continued from Page 20)

als being trained. Although unmentioned in the survey, the principal constraint on expanded training, in my experience, is the "time away from the job."

Job Category	Average Days In Training
DP Management	6.0
System Analysts	10.7
Application Programmers	14.2
System Programmers	8.9
Operations Personnel	9.4

Although managers recognize that training is essential in such a dynamic field, the project schedule seems to put up "blinders" to anything but the near term.

Obviously, the productivity increases from application of new concepts and techniques should far offset the loss of productive time for training classes.

Trainers were asked, "What is the most serious problem you face in carrying out your training job?" The majority of responses fell into five categories:

- Maintaining high-quality, up-to-date and complete training programs (33 responses).
- Lack of support from management (21 responses).
- Time for training (13 responses).
- Lack of qualified training staff (13 responses).
- Budget constraints — high cost of training (seven responses).

Because it is a training organization, Brandon is quite interested in providing assistance in the first and fourth areas. Those of us in academic institutions can also aid in resolution of those problems. Faculty members in a local academic institution have been employed by training directors to aid in designing a career development program for each job category; delineate skills required to maintain a competency in each job category; identify sources for training in each skill area; and perform some of the training.

In some communities, industry and academia work closely to ensure job entry skills and maintenance of those skills.

While the average dollar amount ($518) per person seems quite low, it needs to be expanded by the salary during the time for training. For application programmers, the average salary is $300 per week (*Datamation*, November 1978). So the actual cost of training for programmers was $683 plus $852 (14.2 days at $60 per day) or $1,535.

These statistics remind those of us in the training/education field that we have a precise target. Will knowledge gained in our programs enable a person to recoup the 5% to 8% loss in productive time?

On the other hand, we must also beware the blinder syndrome. We can concentrate so much on the immediacy of the results of training that we neglect the need of the trainees to learn concepts as well as techniques.

Couger is professor of computer and management science at the University of Colorado.

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Firms Provide Useful Service

(Continued from Page 19)

ing kept up-to-date with the findings of the U.S. Department of Agriculture (USDA).

People are aware of some missing items. At the moment, cottage cheese recipes cannot be handled, but once the USDA publishes the nutritional ingredients of cottage cheese in its handbook, that situation will change.

This Pillsbury-Honeywell collaboration shows how computers can be used to tackle everyday human problems with the facilities and the knowledge of the manufacturer, the newspapers and the government.

Sugarless Apple Pie

I particularly enjoyed hearing how Gwen Jankowski of St. Paul, Minn., successfully attacked the problem of providing three diets for her family. She needed one diet for her husband, who suffers from high blood pressure, a sugarless one for herself and a nonacidic one for her daughter.

Her sugarless apple pie is pictured on the front of the Pillsbury brochure advertising its data bank.

As our understanding of important ingredients in individual diets increases, the information in the data bank should broaden and newspapers across the country should be able to give better service to readers of the food columns.

As a result of my wife's recent heart attack, I am particularly interested in the subject. We are facing some of the same problems Jankowski faced. A lot of our friends face similar problems. So this nutritional information will certainly be useful.

Because of the hard work and cooperation of Honeywell and Pillsbury, this nutritional help is offered nationwide. Let's wish them and the data bank an especially Happy New Year for showing us how computers can be used for everyone's benefit.

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A Good Year Overall

1978: Enhancements, Not Breakthroughs

By Don Leavitt
CW Staff

During 1978, users got the word across, in user group meetings and elsewhere, that they want — indeed, need — better tools than they had to meet the continuing pressure from upper management to be both efficient and effective. The vendors apparently heard them; the dominant theme in press releases was enhancement of products that users had found useful.

While there were no major breakthroughs, there were, of course, some major products that did emerge during 1978. The availability of PL/I for Data General Corp.'s Eclipse, for IBM's Series/1 and for Digital Equipment Corp.'s PDP-11 — from a mix of vendors including the hardware vendors and independent software houses — marked the interest users had in getting capabilities developed on mainframes to work for them on the smaller systems.

Perhaps the growth in availability of Pascal compilers for many machines — but especially the smaller ones — was a similar marker, but with a twist. Pascal never was a heavily used language on mainframes, and it wasn't developed or supported by any of the giants of the DP industry. It was and is a user language, and its growth is a clear indication of what serious user support can accomplish.

During 1978, Pascal even came within the interest of the American National Standards Institute (Ansi) and other standards-setting organizations as a proposal to formalize the language (and presumably stabilize it against ineffective variations) gained consideration by Ansi's Standards Planning and Requirements Committee (Sparc).

Review & Forecast

Ansi was busy in other software-related areas as well, approving an updated standard for Fortran — delayed so long that the informal title "Fortran 77" was also recognized, even though 1978 was the year in which the update was sanctioned — but stalling, then trying hard to move ahead again on the sticky subject of data base management systems (DBMS).

Early in the year, the pages of various publications, *Computerworld* among them, and various conferences rang with a debate about whether the Codasyl specifications for a DBMS should be recognized as *the* standard. One study group set up by Ansi died in 1977, but the institute put a group together late in 1978 to take a fresh look at the subject.

APL Standard?

The potential for some sort of APL standard attracted an overflow crowd to a series of seminars in New York City in the spring. On the other hand, Scientific Time Sharing Corp.'s (STSC) introduction of its Automatic Control of Execution (ACE) enhancements to its own APL system seemed to pinpoint one of the problems users of that language have.

STSC called that problem "the tyranny of the terminal" and said ACE would overcome it by allowing users to work with APL development in a conventional interactive mode but let the system function in a batch tempo once the programs were ready for production use.

Various readers and competing vendors, however, countered with claims that they had had similar capabilities, under different names, for years.

The line between word processing and data processing — if it really ever existed — became more blurred during 1978 as vendors on both sides of the line added software to reach across.

Amdahl Corp. began to introduce its own software products this year rather than depend almost entirely on IBM. Both Amdahl offerings — MVS/SE Assist in mid-summer and a VM Performance Enhancement (VM/PE) package in late fall — still work with IBM software, but they suggest the possibility of the West Coast mainframer going further in the new year.

Summit Operating System, Options Support Univac Minicomputer User

IRVINE, Calif. — Sperry Univac Minicomputer Management of Interactive Terminals (Summit), a multitask terminal-oriented operating system for Univac's newly announced V77-800 minicomputer as well as the older V77-600, supports four modes of terminal operation.

In addition to various language facilities that are standard components, the system includes several optional, extra-cost features to extend the user's capabilities even further. Among those features are support for Pascal and a query/update language (QL/77) for operations under Cincom Systems, Inc.'s Total data base management system, a spokesman noted.

Summit supports time-sharing, transaction processing, on-line program development and remote job entry (RJE). It also provides remote processor access from any terminal balanced with a security system to avoid unauthorized access, the spokesman said.

The operating system's Distributed Processing Modules are said to allow Summit-supported terminals to access Univac Series 90 or Series 1100 mainframes, remote V77 minis or IBM 370s.

In addition to Pascal, Summit backs Cobol, Fortran IV, Fortran 77, RPG-II and assembly languages. Pascal is supported as a component of Summit's Structured Programming System (SPS), which allows the user to enter, edit and compile programs for execution under Summit.

SPS also includes a diagnostic facility enabling the programmer to execute a line at a time, a paragraph at a time or an entire program.

QL/77, developed by Univac, provides a means of handling data managed under Total. In common with other on-line query systems, QL/77 allows the user to create a procedure and then store it for later reuse.

Summit Cobol is said to be an implementation, primarily at Level 1, of the 1974 ANS specifications. Fortan IV is a "fully implemented" superset of ANS Fortran, presumably the 1966 specifications.

Only on V77-800

Summit Fortran 77 is available only on the V77-800 with accelerator firmware and floating-point processor. This feature provides "extremely fast" computation using 32-bit single-precision and 64-bit double-precision numbers, the spokesman said.

The earlier Vortex II operating system will continue to be available.

Summit costs $6,000, with the Pascal software available for an additional $2,000 and QL/77 tagged at $3,000, the company said from its minicomputer headquarters, 2722 Michelson Drive, Irvine, Calif. 92713.

NCR Aids Cobol Switch

DAYTON, Ohio — Software that converts programs written in older versions of Cobol into ANS Cobol 74, announced recently by NCR Corp., can now be used on the company's Century 101 or more powerful systems, including N or V mode 8000 series processors, according to a spokesman.

The Automatic NCR Source Word Evaluation Routine (Answer) accepts source programs on punched cards, magnetic tape or disk and reportedly helps minimize the cost of translating programs to take advantage of the extended capabilities of Cobol 74.

Answer converts file-specification-sheet information to the "new descriptive file phrases" of Cobol 74.

The conversion package also produces an annotated listing which shows those lines which required translation together with the statements that replaced them. Since much of Cobol 74 is a carry-over from Cobol 68, a good percentage of any program requires no translation.

The spokesman said a user with more than 50 programs might expect to spend as much as 480 programmer hours on the changeover. With Answer, however, the process can be reduced to about 75 programmer hours, he claimed.

Requiring a system with a 64K-byte or greater memory, two disk units and a printer, the conversion software operates under NCR's Virtual Resource Executive (VRX) as well as earlier operating systems. Answer is available for a license fee of $6,000.

Contracts Studied

MANCHESTER, England — Guidelines for software contracts, which will be published as a handbook, are being developed by a working party of National Computing Centre Ltd. members joined by a representative of the Institute of Purchasing Officers (IPO).

The investigation should help DP and other managers understand the nature of sales contracts in general and software contracts in particular, better equipping them for the negotiations that are becoming prevalent as software acquisitions increase, according to a spokeswoman for the National Computing Centre.

Chaired by the center's group director, E.D. Scriven, the committee is made up of eight people including J.H. Coombs of the government's Central Computer Agency, E.R. Sambridge of IPO and members of the center's Scottish region.

No timetable for publication of the handbook has been announced. More information is available from Scriven at the National Computing Centre, Oxford Road, Manchester M1 7ED, England.

Nercomp Sets Meet Plans

WELLESLEY, Mass. — The New England Regional Computing Program, Inc. (Nercomp) and Dartmouth College will co-sponsor a two-day conference on instructional computing Jan. 19-20 at the college's Hanover, N.H., campus.

Session topics will include courseware development, faculty skills in instructional computing, historical simulations and the use of terminal graphics in the instruction of organic chemistry. The role of computer-managed gaming in agribusiness courses and the teaching of undergraduate macroeconomics with the Modsim software simulation program will also be covered, a spokesman said.

Prof. Eugene Ott and Dr. Nancy Kolodny of Wellesley College, Prof. Michael Carter of Dartmouth and Carl Van Duyne of Williams College will be among the conference's featured speakers.

Two-Tier Fees

Registration fees are $50 for the initial registrant and $30 for each additional registrant from the same institution. Nercomp members will be charged $30 for the first person and $15 for each additional person from the same school or company.

Details and information about Nercomp or the conference is available from Linda Maynard at Dartmouth's Kiewit Center or from Nercomp, 40 Grove St., Wellesley, Mass. 02181.

Programs Handle Basic DP For Ohio Scientific Users

NEW YORK — A trio of programs — Filgen, Update and Format — to handle basic DP chores on an Ohio Scientific, Inc. Challenger II or III microcomputer is now available from Better Programming Systems, Inc. (BPS).

Filgen creates a special header at the beginning of OS-65U(c) data files to facilitate generalized processing of the files by the Update and Format programs, a spokesman explained. Each file record can be 255 characters long with as many as 18 fields, he added.

Update is used to add and change records in a file. A set of six commands is available to work with the file, but none of the commands appears to allow the user to delete a record once it is on the file.

Format is used to design printed reports and CRT screen displays. As many as eight files can be used concurrently, though the spokesman acknowledged such use would make processing "very slow."

The formatting is controlled by abbreviated "shorthand" commands to indicate spacing, skipping, captions for top and bottom of pages and similar repetitious information. Record selection criteria are keyed to field names, the BPS source noted.

Selection Choices

Records can also be selected using "less than," "greater than," "equal to" or "not equal to" criteria. Randomly stored data can be sorted into numerical or alphabetic sequence before being printed or displayed.

Formatting routines can be saved by name for future use, the spokesman added.

The three programs run on a 48K-byte Challenger II or III. A Hazeltine Corp. 1500 CRT is recommended by BPS for use with these processors.

The three-part software system costs $500; future revisions will be sent to all system owners who send a floppy diskette and $20 to BPS at 275 Fort Washington Ave., New York, N.Y. 10032.

'Docgen' Builds User Documents

ELMHURST, Ill. — An on-line system designed to ease the creation of standardized system and program documentation on Datapoint Corp. equipment, Docgen is available from Efax Corp.'s Computer Systems Division.

Described as a series of Databus programs that execute under Datashare, prompting the user to enter pertinent, comprehensive information, the software is modularized to meet the using installation's needs, according to a spokesman.

Five modules focus on differing aspects of the documentation problem, he explained. They produce an overview narrative, equipment configuration description, system and program flow diagrams, program user's guides and file and record definitions.

Table of Contents

The system produces a table of contents along with the documentation itself. Functionally, Docgen serves as a front end to Datapoint's word processing utilities, Dscribe and Mscribe, embedding the special characters they require to format output.

Docgen users do not have to know the internals of Dscribe and Mscribe, Efax said.

Although processing of the Docgen output files by Dscribe and Mscribe must take place under Datapoint's disk operating system, all printing is performed under Datashare using print files via Docgen's print control supervisor, the spokesman added.

Distributed in object code only, on cassette or diskette, Docgen costs $1,750 under permanent license from Efax at Suite 202, 880 N. York Road, Elmhurst, Ill. 60126.

Mini Systems to Grow Too in '79

IBM Relational DBMS Seen Tied to Series E

By Stephen L. Robinson
Special to CW

Data Base Corner

The Nov. 7, 1977 issue of *Computerworld* contained the first fearless forecast. Before embarking on new forecasts, I believe we should examine last year's:

1. *"Vendors of data base packages will expand their offerings of complementary software."*

Certainly true, although some of the package integration I anticipated did not materialize.

2. *"Data base packages on minis will be a hot item."*

Maybe not hot, but certainly lukewarm. Software AG's Adabas has been announced for the Digital Equipment Corp. PDP-11, where it will compete with Cullinane Corp.'s IDMS, Cincom Systems, Inc.'s Total and others.

3. *"Many small businesses will become disgusted with computers and data base."*

Surprisingly, not as bad as anticipated. Businessmen are being properly conservative about acquiring minis and are usually buying end-user systems that truly match their requirements.

4. *"At least half a dozen large DP installations will change data base packages."*

This was a pretty safe prediction. In any given year, more than half a dozen switch from IMS alone.

5. *". . . major data base packages . . . advertising that suggests they are relational and/or distributed."*

I am very happy to have been wrong here.

6. Unfortunately, I was right in that advertising in DP continues to be unregulated.

7. I hereby reinstitute my 1978 IBM predictions for 1979.

8. *"At least two major software houses will announce data base packages."*

Well, almost. Applied Data Research, Inc. (ADR) is acquiring Datacom; Intel Corp. has acquired MRI Systems Corp. and its System 2000 (S2000). All right, Intel is not a software house . . .

9. *". . .application software which is compatible with data base packages."*

Not as much as I guessed.

10. Data base machines. Coming along nicely, thank you; but not off the shelf yet (as predicted).

11. Data dictionaries. Certainly selling well, if not like hotcakes.

12. Codasyl recommendations. Once more, not accepted.

Scoring one point for a correct prediction and one-half point for a partly correct prediction (and counting Intel as a software house??), last year's score was eight out of 12.

Moving on to '79

This year we'll try to do a bit better.

• IBM will announce a new data base package, relational in nature. This announcement will probably be timed to coincide with the release of a new hardware line (e.g., the E or H series). The relational package will not come with an IMS-relational bridge.

• To pacify its IMS users, IBM will announce a hard-wired DL/I for forthcoming hardware. To prolong the life of IMS, and further placate existing users, the relational package will be advertised as being for ad hoc query environments, while IMS will be boosted as the standard for "standard" processing.

In the absence of associate memory, the relational system will be a large consumer of computer resources. This will be further compounded by an English-like query language for the relational data base package.

• The move to minis will continue. IDMS and Total presently lead in this category. Adabas has already announced a full-blown PDP-11 version for January. Datacom and S2000, under their new owners, should be entering the marketplace late in 1979.

• The move to minis will be paralleled by a move to micros. Seed, a Codasyl-patterned package, is already available on a micro. I do not expect other packages to be released for micros in 1979, but it is possible that the end of the year may see some announcements for 1980.

• Both Datacom and S2000 will achieve considerably more success under their new owners, ADR and Intel, both of whom have more experience in software marketing than do their former owners.

• The major data base packages will continue to stress their end-user appeal. Look for query languages operating through data dictionaries; this should provide a high degree of independence from DP names and structures.

• The number of technical data base failures (systems in which excessive computer resource requirements or elapsed run times result in termination of the system project or, more unfortunately, the production system) will increase in parallel with the above cited trend toward end-user systems. The reason is quite simple: Too many users are taking too seriously the now familiar "hardware is cheap and getting cheaper; people are expensive and getting more expensive."

While the statement is true, it is no excuse to ignore design efficiency. A data-based, modular, structure-analyzed, structure-designed, Hipo'd, structure-programmed payroll system that takes 27 hours to generate 4,000 checks (as one did that I saw recently) will be discarded.

The years 1979 and 1980 will be the years of On-Line. Again, unfortunately, look for many failures as batch system logic is simply implemented via terminals. Too many organizations have failed to recognize the need for new systems analysis.

Robinson is an independent data base consultant operating as S.L. Robinson & Associates in Morrisville, Pa.

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Work on Series/1 Backed

THORNWOOD, N.Y. — The EDX Commercial Applications Subroutine Library I has been introduced by the Systems Guild, Inc. to provide commonly needed algorithms for commercial work on IBM Series/1 minicomputers running under IBM's Event Driven Executive (EDX).

Twelve subroutines falling in four basic categories are provided. Working from the $IMAGE utility, the subroutines that enhance static screen formatting provide mapping from disk to screen and back. Others in this group display binary data with a decimal point, a spokesman noted.

String manipulation subroutines provide right and left justification of data in an Ebcdic field. The user specifies the length and address of the Ebcdic field. The subroutines can also compare for greater than/less than values, he added.

A sort facility for working with internal arrays enables the user to specify the address of the array to be sorted, the dimensions of the array, the position and length of the sort key within each element and the location of a work area that must be equal in size to one element in the array.

The fourth category supports date conversions between the Julian and Gregorian calendars and the calculation of differences between two dates.

Library 1 costs $300 for the user's first machine, from 10 Westlake Drive, Thornwood, N.Y. 10594.

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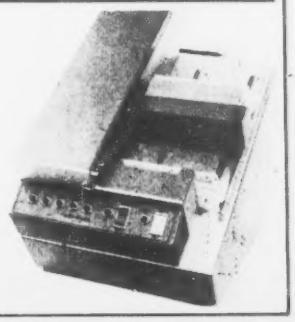

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VLDB Conference Planned

PHILADELPHIA — The Fifth International Conference on Very Large Data Bases (VLDB), sponsored by more than half a dozen professional organizations, will be held Oct. 3-5 in Rio de Janeiro, and U.S. Program Chairman Howard Morgan of the University of Pennsylvania has issued a call for papers to be submitted by March 5.

"Practically oriented survey and tutorial" papers up to 5,000 words long are sought on a range of topics. These include — but are not limited to — data base design, data base software engineering, data base applications and data base machines, he said.

Other possible topics are distributed data bases, data semantics and modeling, user interfaces and implementation considerations, the professor added.

In addition to the formal papers, extended abstracts — two typed pages long — that discuss applications of data base technologies in developing nations are also sought.

Abstracts, papers and requests for more information about the conference should be directed to either Morgan at the Wharton School, University of Pennsylvania, Philadelphia, Pa. 19104 or to Latin American Program Chairman Antonio L. Furtado, Departamento de Informatica, Pontificia Universidade Catolica-RJ, Ru Marques de Sao Vicente, 209-Gavea, Rio de Janeiro, RJ, Brazil.

World Energy Sources, Uses Matched by Model

BETHLEHEM, Pa. — Developed through support from the Exxon Education Foundation, an introductory world energy model and its Fortran IV implementation are now available from the Department of Chemical Engineering, Lehigh University.

The model is "aggregated and relatively low order," according to Prof. W.E. Schiesser, who explained that it does not address in detail international energy flows and markets. Rather, the basic structure and underlying principles can be applied to more complex international energy systems.

The model is a rather unique combination of dynamic, differential equations and a constrained economic optimization performed at each point in time. The constraint ensures a balance between supply and demand in final or secondary energy, the professor added.

The optimization establishes interfuel substitution between five primary energy sources — gas, oil, coal, nuclear and "advanced sources" — according to a supply function for each source and a demand function for final energy.

During the optimization, nonnegativity conditions are imposed on the production rates of the five sources, Schiesser noted.

The model's output moves through time and includes the level of reserves, production rates, investment in exploration and development, prices of the five primary energy sources and the price and demand for final energy.

The Fortran IV implementation includes approximately 1,700 cards, a listing and output of the model base case and a user's manual. The package costs $50, payable in advance.

Checks should be made payable to Lehigh University and addressed to Schiesser at Whittaker Laboratory No. 5, Lehigh University, Bethlehem, Pa. 18015.

Package Handles Freight Ratings

S. HOLLAND, Ill. — Freight shipping information, tariff rates and commercial transportation charges are said to be part of a software package designed by the Transportation Data Management Co. (TDM) for users of IBM 360/370 or Digital Equipment Corp. PDP-11 CPUs.

The First Rate system facilitates the shipping of cargo from one point to another by providing the latest destination, duty and load weight figures in a rating and auditing data base, a spokesman said. The system functions under IBM CICS and Vsam under VS1 or VS2, or under DEC's CTS500 operating environment.

The software's shipping information reportedly meets standards prescribed by the Transportation Data Coordinating Committee and the system supplies rate retrieval, bill of lading rating, warehouse location and freight accounting statistics. First Rate also provides rate audit before and after payment, assembly and distribution surveys and management reports, the spokesman continued.

The programs are written in Cobol and available in motor carrier, rail, freight-forwarding, ocean, barge, air and private fleet operation modes.

First Rate costs $150,000 and information updates are provided by TDM at a price based upon individual user needs, the spokesman explained. As a service, it is also available on a time-sharing basis from the Illinois-based company.

A mileage calculation package that breaks destinations into 3,300 key points and computes shipping charges according to miles is also offered by the firm for $30,000 minus data.

Information about the software package and other services can be obtained from TDM at 1451 E. 168th St., S. Holland, Ill. 60473.

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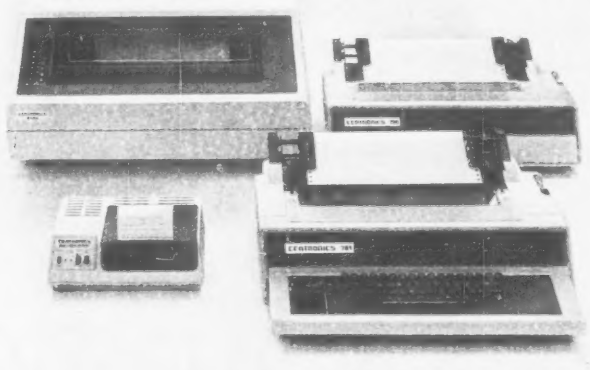

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The Key Word in 1978? 'Integration'

By Ronald A. Frank
CW Staff

NEWTON, Mass. — "Integration" was the key word in the communications field this past year. Technologies, services and equipment all phased into integrated modes, and there was talk of more to come.

Archie McGill, director of market management at AT&T, described the impact merged technologies will have on users when he said that voice, data, image, message systems, sensor-based data and office operations can be part of a single processing system that would benefit the company and contribute to earnings per share.

As the year began, Satellite Business Systems (SBS) demonstrated how satellite links would provide new services on integrated facilities. High-speed data, high-speed facsimile and teleconferencing were shown as part of Project Prelude to whet the appetites of a few selected large users.

A library in Texas began using a fiber-optic circuit to transmit data from a terminal to a CPU and, at various conferences, several firms began to demonstrate limited-distance fiber-optic systems for data transmission.

Motorola, Inc., introduced a portable terminal that combined RF radio frequencies with more conventional DP transmission devices to allow remote input to a DP center.

The Consultative Committee on International Telephone and Telegraph (CCITT) paved the way for integration of public packet-switched nets on an international basis when it approved the X.75 gateway interface for interconnecting X.25 networks.

The elusive office of the future came a bit closer as users began to talk about combining functions that are now separate. Several users connected word processing equipment to the DP center, and the computerized PBXs promised to combine voice data and other types of transmissions through a common control point.

Review & Forecast

Even packet nets no longer relied on a single technology to achieve their service goals. In some places, hybrid nets integrating packet-switched and fast circuit-switched technologies were implemented.

A major step in the evolution toward integrating computer and communications came when AT&T unveiled its Advanced Communications Service (ACS) at mid-year. Aside from the regulatory questions it raised, it became clear that AT&T intends to support a long list of terminal types that would otherwise be incompatible. The possibility of running diverse equipment through a single integrated network held great promise for the user.

A previously defined boundary separating packet-switched circuits from private-line nets was blurred when both Telenet Communications Corp. and Tymnet, Inc. introduced private net versions of their packet technologies. A few larger companies began to configure in-house packet nets along these lines.

At mid-year, a rewritten Communications Act was introduced that would allow both monopoly and competitive services to operate side by side. But competition proponents in the House of Representatives were fearful that Bell would use its clout to exact an unfair advantage.

Network architectures lost much of their rigidity during the year. Digital Equipment Corp. introduced software that allowed previously incompatible operating systems (and CPUs) to operate together under Decnet. IBM announced a half-duplex protocol for remote batch work for its much touted full-duplex Systems Network Architecture (SNA).

Late in the year, users seeking a way to perform polling functions on packet nets looked at the 9100 network interface processor from Cambridge Telecommunications, Inc., and consultant Dixon Doll predicted a network "supercontroller" that would tie network functions into one system.

Xerox entered the network sweepstakes with its Xten entry, apparently aimed at document transmission, and General Telephone and Electric and Telenet began finalizing plans to merge at year-end.

As 1979 begins, it is clear that previously separate services are coming together and multifunction terminals are combining more and more communications operations into one unit.

The day of the single-purpose application network is disappearing in favor of services that will handle a variety of user needs. Through it all looms the prospect of decreased costs through integrated communications capabilities.

Most of the new services like ACS, SBS and Xten are shooting for 1981 start-up dates, and users are beginning to realize that the promised total corporate communications systems may be little more than a year away.

Net Architecture From DCC Gives Users DDP Environment

MEMPHIS, Tenn. — An architecture that provides an on-line, real-time distributed data processing (DDP) environment has been introduced by Data Communications Corp. (DCC). Called suitable for first-time DDP users, the Transaction Network Architecture (TNA) can integrate either a locally or remotely interconnected network of dedicated minicomputers, the vendor said.

Communications between processors is provided through standard leased telephone facilities or shared communications services, a spokesman noted.

Modular hardware and software components combine to yield only the required functionality at each processing node, he said, adding that this modularity allows configuration flexibility and is directed at the diversified DDP needs of such organizations as banks, manufacturers and freight handlers.

The architecture includes a number of remote clustered terminal controllers that can be main memory-based or disk-based, depending on requirements for local format storage, local file validation or store-and-forward capabilities.

The controllers poll available applications programs from host processors and allow remote terminal systems to particpate in their execution as if they were local, DCC explained.

A remote terminal may initiate transactions for both local and remote applications software provided by a host minicomputer, the

(Continued on Page 30)

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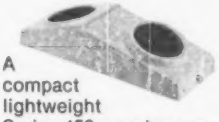

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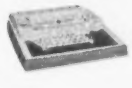

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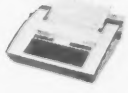

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NCR Adds Entry-Level Unit for Food Stores

DAYTON, Ohio — NCR Corp. has announced a food store electr nic cash register which it said can be upgraded to Universal Product Code (UPC) scanning and later to an on-line terminal capable of communicating with an in-store computer.

The NCR 2140 food system was designed for those supermarket operations which do not need the full processing power of an in-store computer now, but may require that capability in the future, NCR said. It can be installed as a basic stand-alone system and can migrate to an on-line system linked to an in-store computer, with more powerful transaction processing and information handling capabilities.

Three model groups compose the 2140 system:

- The 2140-1500, which provides transaction-handling capabilities plus the ability to accommodate a number lookup feature, electronic scales and a consolidation feature. It will be available in the first quarter of 1979.
- The 2140-1600, which will be available in the third quarter of 1979 and includes all the features and options of the 1500 plus additional enhancements of those features and functions.
- The 2140-1700, which will be available in the fourth quarter of 1979 and includes all features of the 1600 system plus the capability to add mass memory, UPC scanning, common-carrier communications and data collection with cassette recorder. It also features the ability to share resources such as the large memory and the cassette recorder.

The models in the 1500 group can be upgraded to the 1600 and the 1600 can be upgraded to the 2140-1700 at the option of the user at a minimal cost, NCR said.

Basic models in each group are priced at $2,385.

Architecture Links Minis In On-Line Environment

(Continued from Page 29)

vendor explained. The TNA allows multiple language applications processing as transactions are received from either local or remote terminals attached to various dedicated modules of the total architecture.

The user interface to a particular application — at either a local or remote terminal — is independent of where the application is actually processed, DCC continued. TNA features include dual-processor configurations, multiple program execution, concurrent program development, mutiple languages — including Cobol, Fortran and Algol — and a "warm/cold start capability" combined with automatic recovery.

Dual-processor shared-disk configurations provide redundancy for critical applications, according to DCC. A Remote Processing System (RPS)/Dual configuration consists of two processors, connected by a high-speed interprocessor bus, which share a data base.

Multiprocessor configurations in the TNA permit multiple systems to be interconnected locally via special adapters. A Distributed Processing System (DPS)/Multi configuration offers the ability to process multiple applications by interconnecting single- and dual-processor systems, the vendor said.

File Management

TNA's network file management permits on-line file access through the Transaction Definition Language. Information from local or remote data bases may thus be accessed as an integral part of a transaction data entry procedure, the spokesman said.

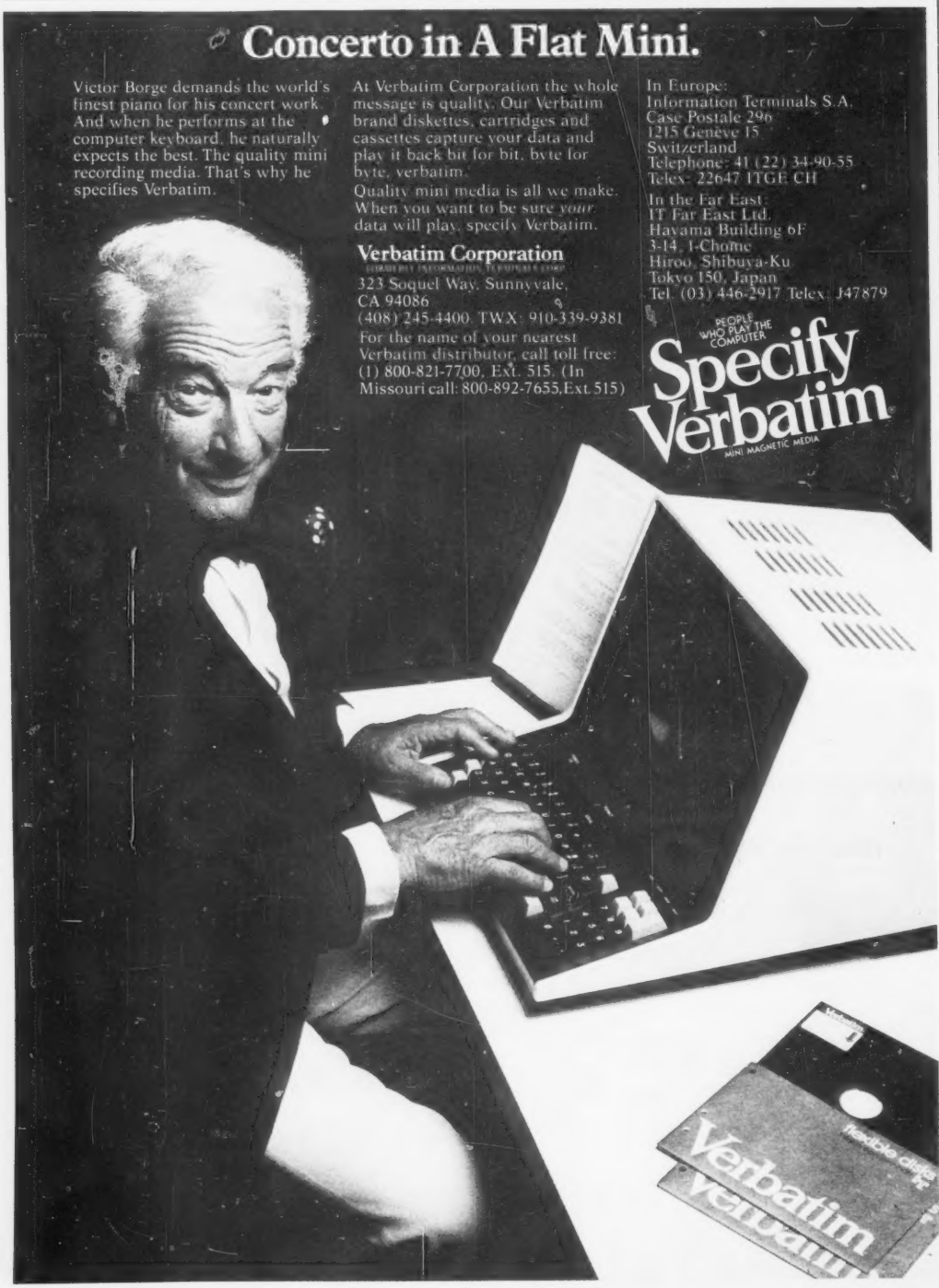
Network file utilities include a general-purpose file transfer and update facility so remote data bases — including program and validation files — can be easily maintained and updated, the vendor claimed.

Depending on the volume of data to be handled, systems can be linked to a TNA network utilizing either point-to-point or multipoint protocol. Both protocols operate in full-duplex mode, DCC said.

Datacom Co., a DCC subsidiary, offers a communications service to TNA users that is based on a DCC network with drops in more than 100 cities. Any U.S. business can link the remote terminals of its branch offices to its host CPU by employing this network.

The purchase price of the TNA varies with the configuration ordered, the spokesman said. He noted, however, that typical configurations would range from $40,000 to $50,000.

DCC is at 3000 Directors Row, Memphis, Tenn. 38131.



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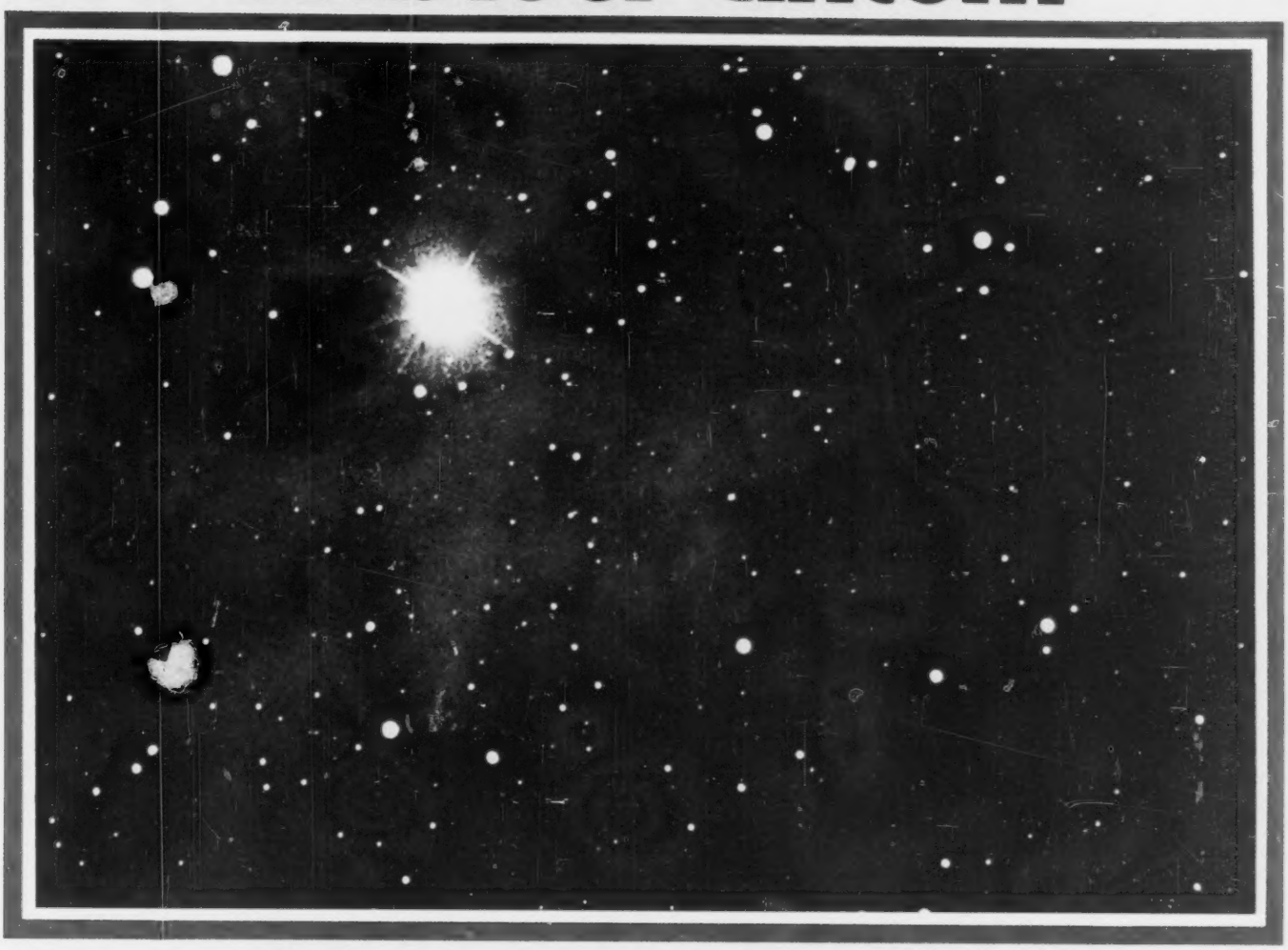

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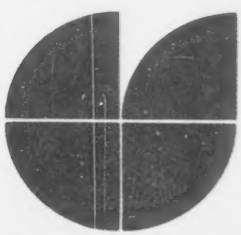

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Unit Documents Datascope Data

MOORESTOWN, N.J. — Spectron Corp. has introduced a peripheral for its family of Datascope data communications test instruments to monitor data, print hard copy and provide documentation of network data transmissions and test procedures.

Designed to help give thorough network documentation when bringing a new network on-line, or for modifying or troubleshooting an existing system, the D-201 printer/monitor can be used as a peripheral to Spectron's D-500 and 600 series of Datascope monitors.

The D-201 can monitor asynchronous lines at any transmission rate from 50- to 9,600 bit/sec. Used with a compatible Datascope monitor, the D-201 provides hard copy of data originally sent at up to 100K bit/sec using "any" line discipline.

It prints Hex, Ascii, Ebcdic and other codes at up to 900 char./sec. As a stand-alone, hard-copy line monitor, the D-201 provides simplex and half-duplex operation, the firm said.

The printer/monitor costs $4,500 and is available from Spectron Corp. at 344 New Albany Road, Moorestown, N.J. 08057.

Tape Transport Works As Synchronous Unit

SAN DIEGO — Tandberg Data, Inc. has introduced the SCDR 1050 serial communications data recorder, a "compact and nonattended" half-inch synchronous tape transport for use as a data logger and station message detail recorder.

Normally connected to RS-232C communications interfaces, the Tandberg SCDR can be used with the Northern Telecom Ltd. SL-1 computer-controlled, private branch exchange and other "smart switches" as well as any other data-logging applications requiring IBM-compatible half-inch tape format, Tandberg said.

The SCDR 1050 provides 1,600 char./in phase-encoded or 800 char./in NRZI data density at 45 in./sec, according to a spokesman. The unit features sequenced power-fail recovery.

SCDR standard record lengths consist of 2K bytes that are temporarily stored in the RS-232C interface buffer memory. When full, buffer memory contents are written on tape as one industry-compatible standard record, enclosed by interrecord gaps, Tandberg said.

The SCDR interface is a microprocessor-controlled, direct memory access (DMA) device. The microprocessor issues commands and receives status data from both Tandberg's TDF 4050 formatter electronics and the serial communications interface.

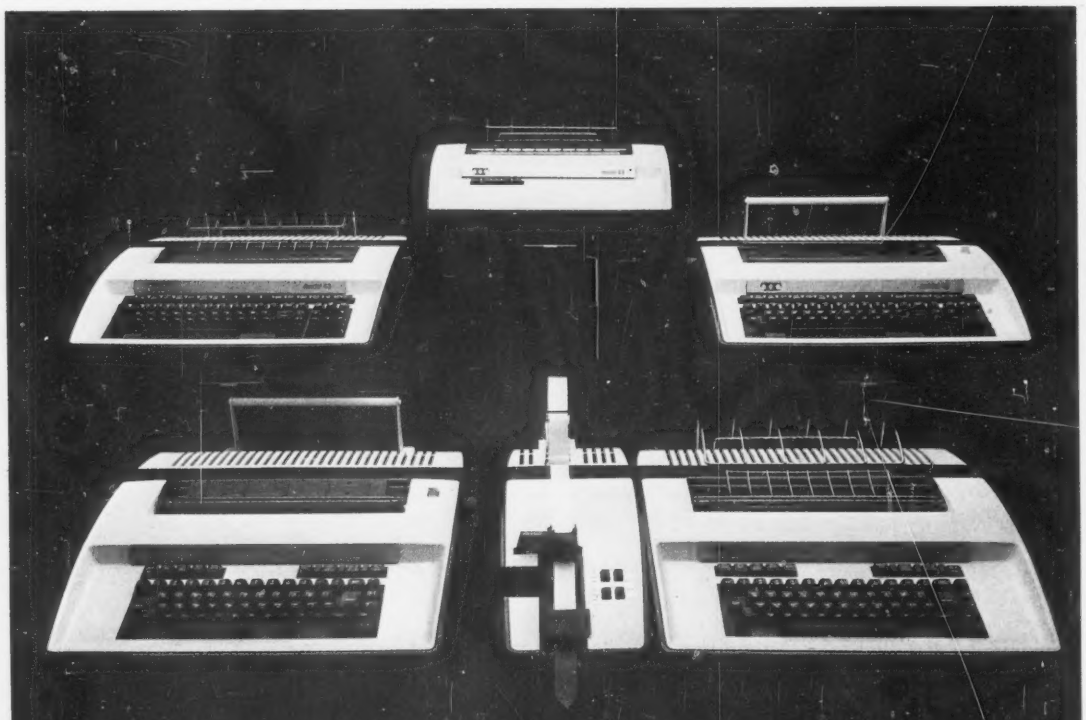
An asynchronous communications interface adapter connects serially with the RS-232C or teletypewriter current-loop interface; all electronics are physically mounted in the tape transport chassis, the spokesman noted.

Control Program

The control program resides in read-only memory and input or output data buffers are established in 4K bytes of random-access memory (RAM). Data transfers between interfaces and the RAM are controlled automatically by DMA without processor intervention, Tandberg continued.

The SCDR 1050 is said to provide 5,000 hours mean time before failure, ceramic-blade tape cleaners, single-board electronics and a microprocessor-driven servo system. Compliance-arm tape path geometry is reportedly optimized, minimizing dynamic skew.

The SCDR 1050 costs $8,500, Tandberg said from 3593 Fifth Ave., San Diego, Calif. 92103.



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Model 43's come in a variety of configurations with either 80 column friction-feed or 132 column pin-feed printers. Some units are designed for use on the switched network, others for point-to-point private-line systems. (There's also a new generation of 5-level buffered teleprinters for Telex applications.)

The basic model 43 series operates on-line at 10 or 30 cps in either the half- or full-duplex mode and prints multiple copies using the 96 character ASCII code set. A wide choice of interfaces, including EIA RS232C and DC 20-60ma, are available for easy system integration.

With the automatic send-receive configuration, messages can be prepared off-line via the paper tape punch, edited, combined with a master tape, then sent at maximum terminal speed—automatically and unattended—when line rates are lowest.

Buffered 43's operate on-line at speeds ranging from 10 to 180 cps and provide up to 20,000 characters of storage for sending, receiving and editing. These terminals send and receive automatically via the buffer while messages are simultaneously being prepared for future transmission. They also include full forms control, the automatic answer capability and answer back.

Just like its predecessor, the legendary model 33, our model 43 family is designed for extreme reliability. The reason is simple: simplicity. Our model 43's use only five major pluggable components (six, counting the paper tape module on the ASR), along with extensive use of LSI circuitry.

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But Other Vendors Hustling, Too

Last Year Clearly Belonged to IBM User

By Howard A. Karten
CW Staff

NEWTON, Mass. — If DP users designated years with symbols, the way the Chinese calendar does, 1978 would clearly have been "The Year of the IBM User," as vendors competed vigorously to give customers hardware choices compatible with the de facto software standard established by The Jolly Grey Giant.

Six newcomers to the field of IBM-compatible software suppliers joined the two old-timers, Itel Corp. and Amdahl Corp. — themselves only young whippersnappers — as the latter two firms also broadened their product lines, again increasing the capacity of their largest systems. The additional measure of choice for users seemed to put them in the position of children in old-fashioned candy stores wondering which goodies to buy.

Review & Forecast

The newcomers are Two Pi Co., Magnuson Systems Corp., National Semiconductor Corp., Nanodata Corp., Cambridge Memories, Inc. and Citel, Inc.

This pattern was also reflected in plug-compatible memory, as more vendors not only offered such memory products but in prices and sizes not available from IBM.

The year's three major announcements in disk drives — again, aimed at wresting revenues from IBM — not only provided users with new alternatives but may be the prelude to a long-expected disk product from IBM.

And, adding more fuel to the fire, IBM's two major fourth-quarter announcements — price cuts on two major disk drives and on Mosfet memory — seemed sure to heat up the action for 1979.

IBM itself brought out only two major products during the year — the 8100 distributed processing system and the smaller System/38 — and enhanced memory on the 3033, but the unseen hand of the company was nevertheless present in virtually every major hardware development.

And the company's Christmas present to users — significant reductions in prices on Mosfet memory and the ability to double the maximum memory on the 3033 — should go far towards stimulating business and possibly reducing the impact of a predicted recession for 1979. The move was interpreted by some observers as IBM's attempt to stem the tide of growing business losses to the inde-

(Continued on Page 34)

Business DP Seen Adaptable To Tribal Mode of Operation

By Howard A. Karten
CW Staff

SANTA CLARA, Calif. — Business DP could be run the way Indian nations ran their tribes, according to Dr. Jared A. Anderson, president of Two Pi Co. here.

Each chief ran his tribe by himself, but conferred with other chiefs on matters that affected all tribes or that were too big for him alone.

Like Indian tribal matters, DP problems could best be solved by giving each user department as much control as possible over its own DP needs but retaining a "council" — or mainframe — for the problems that impact all user departments or are too big for any one group of users to tackle.

This decentralized approach is common in business as well, where, for example, a division manager often has complete (i.e., profit and loss) responsibility for his division, Anderson indicated. And it will be increasingly reflected in the DP setup businesses choose, as the steadily decreasing cost of DP hardware enables each division or user of DP services to have its own, on-site hardware, he added.

"The chief appeal of distributed DP [DDP] is that operating groups are freed from dependence on the large, centralized CPU, which is considered a bottleneck and a constraint in the various business groups," he noted.

But, is it necessary to place hardware at individual sites? Anderson was asked. Why not use a high-speed communications setup in which a department uses high-speed input and output devices linked by communications lines to a centralized processor? Wouldn't this provide the same benefits as DDP without the extra hardware cost?

"That's not what is meant by DDP," he replied. "[The concept outlined above] doesn't distribute the intelligence of the mainframe out into the local departments. The idea is to let local departments do the things they can, and let the data be processed locally as much as possible. The mainframe could be used for data base updates, for example, if the

(Continued on Page 38)

Bits & Pieces

Chaintrain Line Gains 600 Line/Min Printer

MALDEN, Mass. — Data Printer Corp. has announced an addition to its Chaintrain series of printers, the 600 line/min Model 1260.

Featuring motorized upper and lower tractor positioning, complete microprocessor control and plug-to-plug compatibility with all Data Printer models, the unit prints up to 132 char./line at 10 char./in. spacing, the company said.

Available with a Gothic or Courier type face, the unit prints six-part forms ranging from 3.5- to 19.5 in. wide, according to a spokesman. Six line/in. spacing is used, with a paper slew rate of 20 in./sec.

The buffer on the unit can hold a line of print, the company claimed, adding that an electronic vertical forms unit is available as an option.

A 64-char. set is standard, with optional 48-, 96- and 128-char. sets available. The printer ranges in price from $10,700 to $12,000 depending on options, the spokesman said from 99 Middlesex St., Malden, Mass. 02148.

Dema Sets Meeting Schedule

GREENWICH, Conn. — The Data Entry Management Association (Dema) has announced its 1979 regional meeting and seminar schedule.

The first meeting of the year is set for the Boston area Jan. 15-17 at the Hyatt Regency Hotel in Cambridge. Two seminars will be presented at that meeting — one on managerial techniques for first-line supervisors and the other on concepts and techniques of information systems, aimed at broadening the perspectives of the data entry manager.

Other meetings are set for Atlanta in February, Chicago in April, Denver in May, and San Francisco in November. Dema can be reached at 16E Weavers Hill, Greenwich, Conn. 06830.

Year Saw Vendors Vying to Serve IBM Users

(Continued from Page 33)

pendents.

Among the disk drive announcements was a device incorporating two firsts — the first major use of charge-coupled devices (CCDs) in a product aimed at mainframe users and the first solid-state disk, a replacement for the venerable IBM 2305 drum.

Storage Technology Corp. (STC) followed its announcement of a nonrevolving (though nonetheless revolutionary) solid-state disk [CW, Sept. 25] with another first — a quadruple-capacity, 3350-compatible disk that doubled the previously available information packing density [CW, Dec. 4]. It was joined in this by Control Data Corp.'s announcement of a product that gave users a similar increased density, but without the doubling achieved by STC.

These developments, coupled with IBM's reduction in disk prices [CW, Nov. 13] fueled speculation — already at a high pitch — about IBM's long-awaited "Whitney" disk project. Although several sources have predicted that the Whitney project also involves a quadrupling of capacity over current systems, few IBM watchers were willing to commit themselves on the exact nature of the project.

Joining the list of IBM competitors with major mainframe announcements were Honeywell, Inc. and NCR Corp., both of which brought out equipment with capacities comparable to the 30 series. Honeywell's Level 66/DPS, introduced early in the year [CW, Feb. 6], was the only high-powered machine specifically aimed at taking advantage of the excitement surrounding this year's most prevalent DP buzzphrase, "distributed processing."

Honeywell said the five models in the series provide power roughly overlapping that of the three models in the 30 series.

NCR's V-8650 and V-8670, also claiming power comparable to the 30 series, were that firm's first venture into high-powered CPUs. The Dayton firm also increased the maximum power of its N-8300 series with the N-8370.

Univac also joined the high-powered game, bringing out two systems: the 90/80-4, said to exceed the power of an IBM 3031 [CW, May 22], and the smaller 90/40 [CW, May 1].

National CSS, Inc. and Two Pi, Inc. unveiled their 3200 system in April [CW, April 17], the first of six minicomputers designed to use IBM software and compete at the low-to-medium end of the IBM 370 line. They were followed by National Semiconductor's announcement of the S/400 [CW, May 8], and Magnuson Systems Corp.'s M80 [CW, May 22].

Then came Cambridge Memories with the Model 1600 and Nanodata's announcement [CW, Oct. 16] of a minicomputer that could emulate several different systems simultaneously. Citel, Inc. also introduced a 370-compatible mini [CW, Oct. 23], although the company's end-user marketing plans were vague when the Citel 30 series, models 3 and 4, were announced.

Add-Ons

Add-on memory was also an active area this year, with several firms bringing out memory for the 370 line as well as the 30 series. Memorex announced an add-on memory for the 370/168 [CW, Feb. 20] and was followed by Cambridge Memories with add-on memory for the 30 series [CW, May 1]. Four firms — Electronic Memories & Magnetics Corp., National Semiconductor Corp., Memorex and Intel Corp. — displayed new add-ons at June's National Computer Conference, adding to the array of choices.

The plug-compatible mainframers, too, were busy, with Itel adding two systems to the lower end of its line [CW, Sept. 11] as well as a top-of-the-line model — the AS/6 Model 2 [CW, Nov. 6]. That system is faster than IBM's 3032, the firm claimed.

Amdahl's response in this "my old man can lick your old man" race was its 470V/8 [CW, Oct. 23], which again extended the top performance range of the company's products. Figures worked out by *Computerworld* indicate the system is 1.5 times as powerful as IBM's 3033, which would make it the single most powerful (uniprocessor) system yet introduced in the U.S.

The award for "most computer power offered commercially by any mainframe vendor" clearly goes to IBM for its introduction of a multiprocessor (MP)- configured 3033. Although not necessarily a bargain for users [CW, April 4], the MP configuration can process instructions 1.6 to 1.8 times faster than a uniprocessor 3033, IBM claimed.

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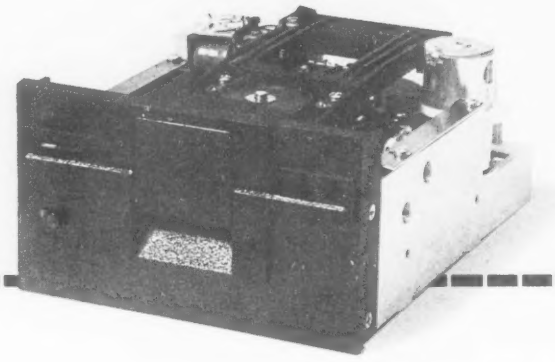

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Head Setting Time	10 msec (last track addressed)
Head Loading Time	35 msec (maximum)
Error Rate	1 per 10^9 recoverable (maximum) 1 per 10^{12} non-recoverable (maximum)
Head Life	20,000 hours (normal use)
Media Life	3 million passes on a single track
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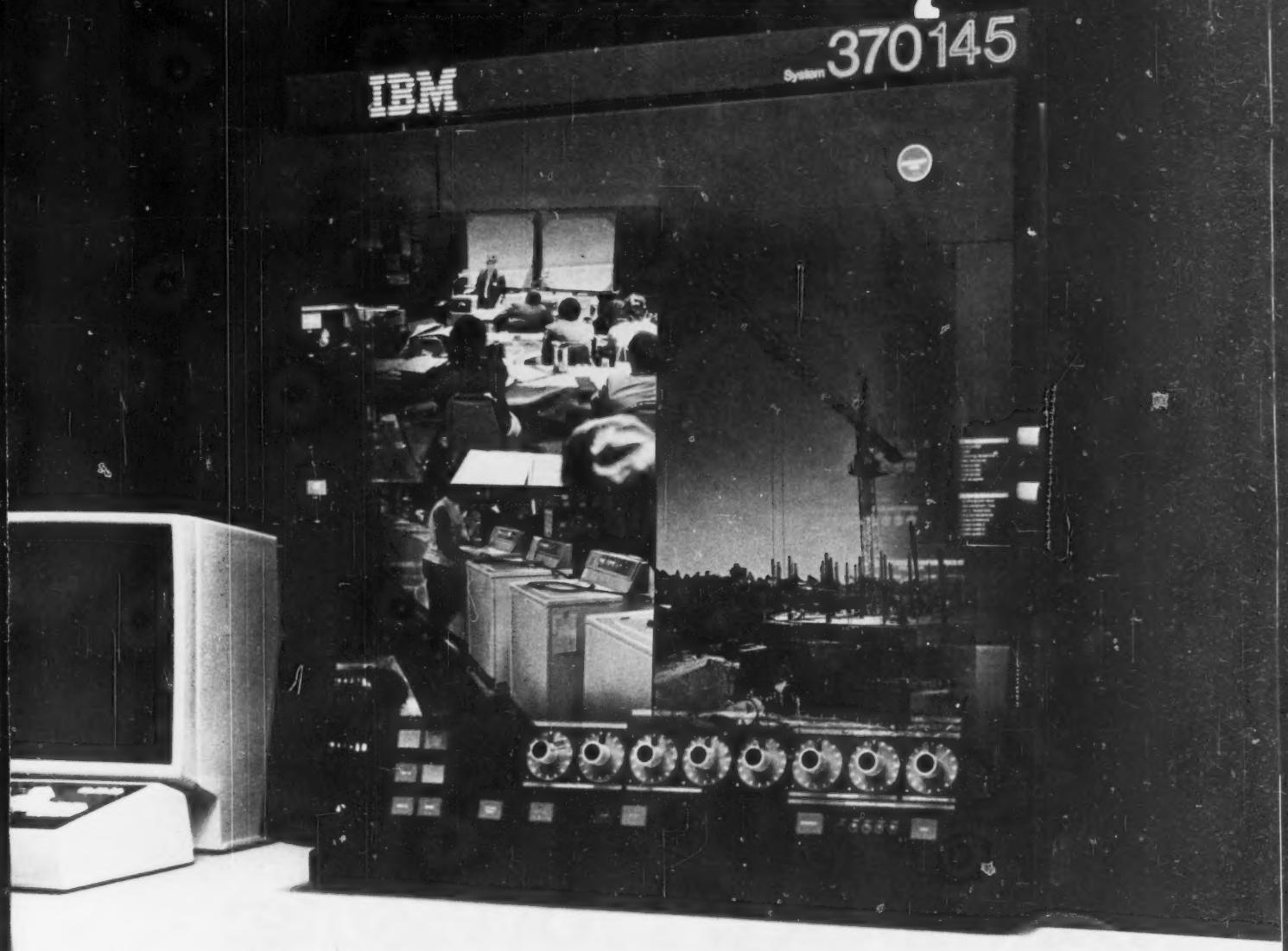

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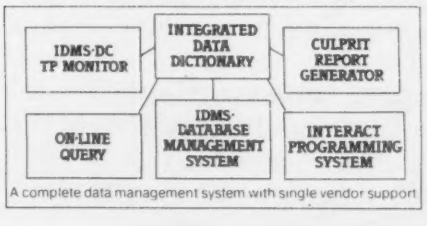

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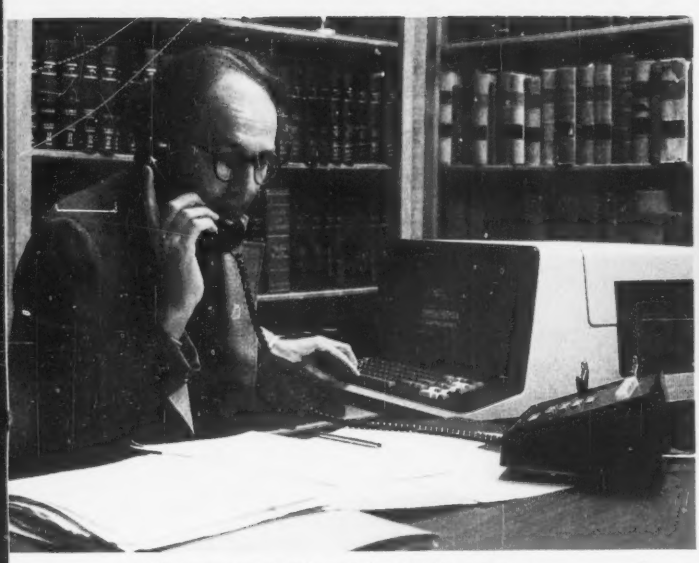

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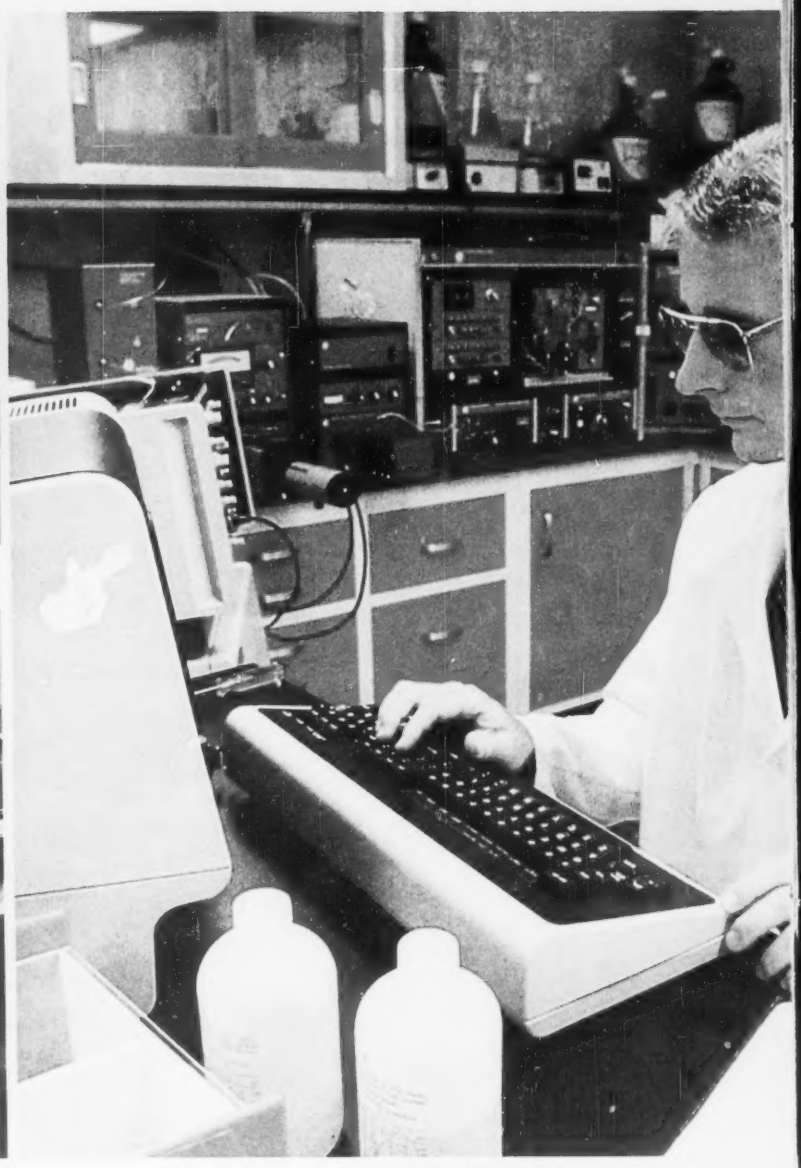

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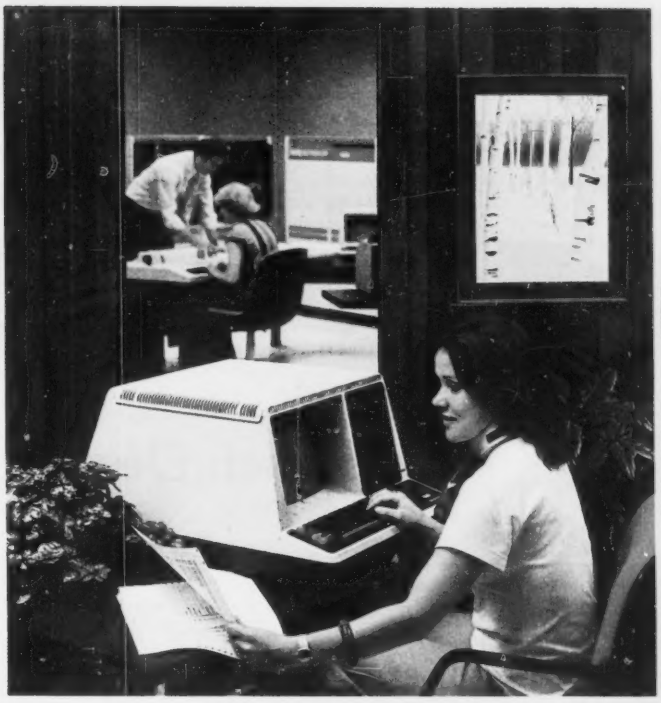
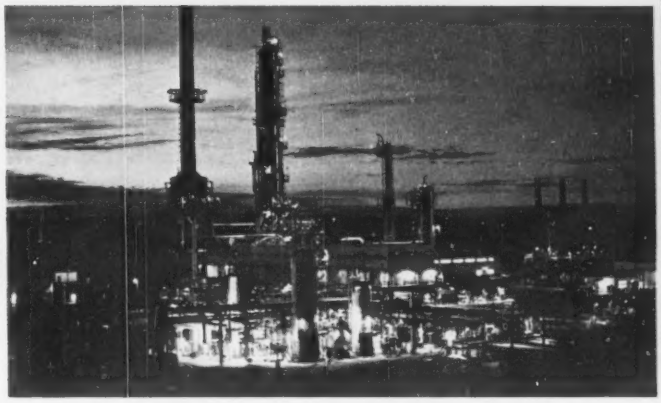


to interactive mainframe systems...



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IRS OKs Use of Microfilm in Place of Paper

TORRANCE, Calif. — The Internal Revenue Service (IRS) is letting companies — at least those that have converted their records to microfilm and microfiche — burn their financial books behind them.

"Federal and state laws have recognized the value of micrographics," David S. Shanks, president of Computer Micrographics, Inc., said, "by allowing microfilmed records to be legal substitutes for original, paper-based records."

Micrographics is the technology of reducing all forms of business data to microfiche, a postcard-size piece of film and other types of microfilm.

Twenty years ago, Congress enacted the "Uniform Photographic Copies of Business in Evidence Act" (Section 1732 of Public Law 129). Subsequently, every state but Louisiana adopted similar legislation while the IRS, under Revenue Rule 76-265, ruled that the "microfilm (including microfiche) reproduction of general books of account will be considered books and records . . . " in case of audit.

"However, in discussions between micrographics industry sources and the IRS, it was determined that the original IRS procedure generated more questions than it answered," Shanks explained.

"Some months ago," he continued, "the IRS issued its final ruling on the subject, Revenue Procedure 76-43, which established specific conditions and standards that must be met in order to obtain permission to retain records solely on microfilm."

Now, whether they are financial records used for an Internal Revenue Service audit or as legal evidence in a court case, microfilmed documents are acceptable in 49 out of the 50 states, Shanks pointed out.

"As companies expand and produce more and more information in today's environment," he said, "so the legal requirements to retain that data increase. Micrographics has become a practical alternative to paper."

In addition to meeting the requirements set forth by the IRS, federal laws and users themselves, the microfilming of records has immediate and tangible advantages for a company, the executive pointed out.

"By sanctioning the transfer of data from paper to film, federal and state governments and the IRS are, in effect, encouraging companies to do what micrographics has done for so many years, — eliminating — the paper monster in today's business community," Shanks concluded.

Tribal Approach Described

(Continued from Page 33)

necessary calculations can be performed locally.

"While low-cost terminals and computers have proliferated, there is growing evidence of disappointment and confusion resulting from the dispersed DP concept," Anderson noted. "The trade and business press repeatedly run stories of caution and explore widespread difficulties in integrating the dispersed sites and finding software that works. Only a handful of large companies have even attempted a comprehensive implementation of the distributed processing concept," the company president stated.

Spread of DDP

One of the factors that will strongly contribute to the spread of DDP is the broad knowledge and use of IBM 370 software, according to Anderson. Both the 370 instruction set and finished 370 software have, in effect, become a standard that will be around for a long time, he indicated, adding, "The 370 instruction set has been so firmly implanted in DP today that it is not presently conceivable that anyone would throw out the estimated $200 billion that exists in software."

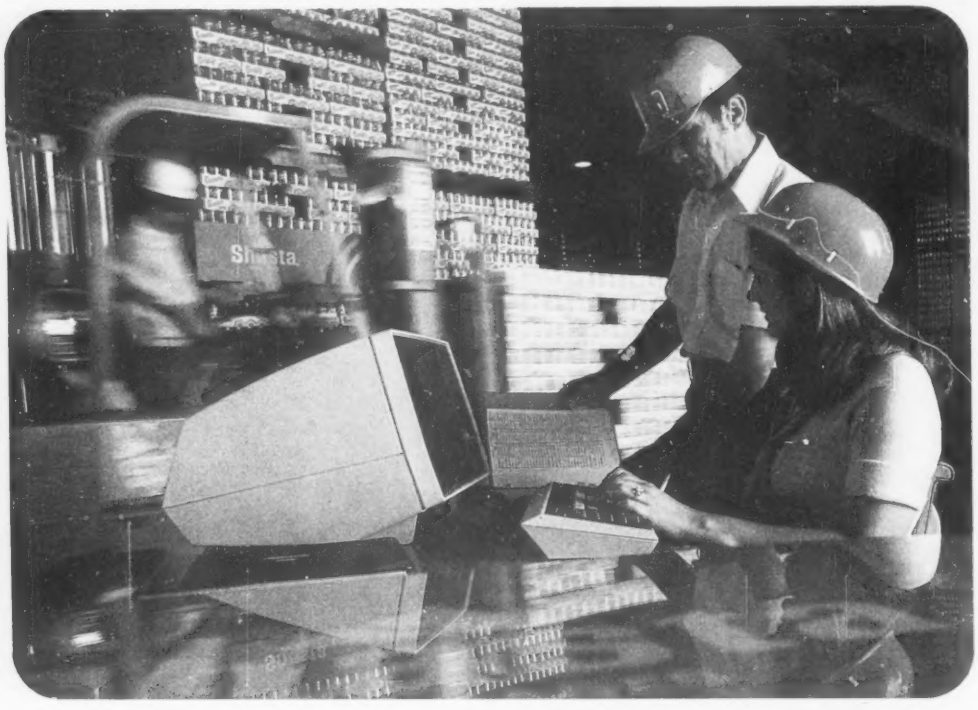
Therefore, while languages and computer communication may well change radically — as Charles Lecht and others have predicted — language processors will still be required for this task. "There will still be lots and lots and lots of 370 programs running on machines that are 370-compatible," Anderson said.

To support this contention, he pointed to what he called "tons and tons" of companies that are getting good results with programs that were written for 1401s. "They've never been reprogrammed, never been recoded and they work just fine."

Two Pi stands to gain considerably if Anderson's predictions come true: The company, a part of the Netherlands-based Philips company, manufactures the V32 370-compatible mini introduced recently [CW, April 17].

Anderson's vision of the future of DDP is a 370-compatible network. "Each one of the distributed users will be able to write his own programs, do whatever he wants, run his own business — and the centralized mainframe will be like the council, where the results will be reported, audits will be performed and so on. What makes it nice is that everyone [will be] working in the same language. In the past, this was just too expensive.

"Also, it's easier [now] to find someone who is familiar with the user's problems and knowledgeable in 370 concepts than is knowledgeable with minicomputers," he said.



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As '78 Products Show

Vendor Interest in Business DP Grows

By Jeffry Beeler
CW Staff

This year's activity in the minicomputer sector reflected a growing vendor concern for the problems and needs peculiar to business system users, especially inexperienced ones.

Although technological innovations continued to play an important role in minicomputer developments, vendors became increasingly aware that results mean far more to business DPers than a machine's internal workings.

As a result, product philosophies in many companies shifted perceptibly. "Human engineering" became a stock phrase in product pitches, and more than one manufacturer touted its wares not as minicomputers, but as "solutions to user problems."

Vendors that had previously confined their design efforts to technical matters like increased bit densities and reduced cycle times now turned their attention increasingly to more "human" considerations like packaging and convenience features. Minis became easier to use and program, more visually appealing and more responsive to changing user needs than ever before.

In short, they became less of a specialty item and more of a general-purpose one, aimed squarely at nontechnical buyers.

At the same time, minis hed some of the mystique that has often made them seem remote, intimidating and unapproachable to business and lay personnel. Digital Equipment Corp. may have done more to "humanize" small business systems than any other vendor when it offered its low-end Decsystem 150 with a series of optional silk-screen prints that reputedly harmonize with most office decor.

In their attempt to adapt computers to a relatively new class of technically unsophisticated customers, vendors addressed some issues close to the heart of business DPers everywhere. "Compatibility" became the latest industry buzzword as manufacturers scrambled to exploit what they perceived as the chief weakness in IBM's small systems line: inadequate upgradability.

Review & Forecast

Not surprisingly, vendors attacked the problem of product-line compatibility from different angles. Honeywell, Inc. designed its Level 6 minicomputer family so users can literally transform each member of the line into any other member simply by adding or removing processor, memory I/O boards.

Data General Corp., by contrast, stressed software compatibility rather than hardware compatibility when it added the low-end CS/20 and the high-end CS/60 to its CS/40 small systems series. Because the CS/20 and CS/60 use different processors — the Micronova and Eclipse S/130, respectively — DG users can upgrade their hardware less

(Continued on Page 47)

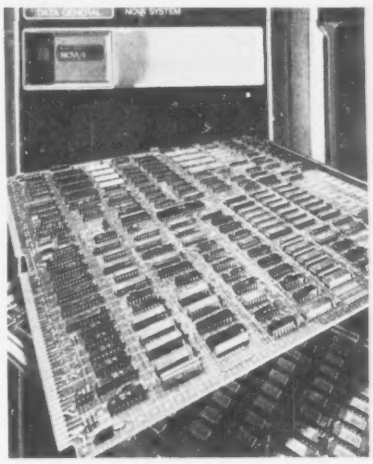
Three CPU Additions Broaden DG's Nova Performance Range

By Jeffry Beeler
CW Staff

WESTBORO, Mass. — Improved reliability, increased computing speed and a broadened range of configuration options were reportedly added recently to the Data General Corp. Nova line when DG expanded that minicomputer series with three additional single-board processors.

Christened the models 4/C, 4/S and 4/X, the processors broadened the Nova family's performance range at both the high and low ends, according to a DG spokesman. Although the 4/X corresponds roughly to the Nova 3/ — the family's previous high-end member — the more recent system executes instructions 50% faster and costs 20% less than its nearest relative, he said.

The 4/S corresponds roughly to the middle-of-the-line Nova 3/12, but provides 50% more computing power and costs 10% less than its older counterpart. The 4/C, meanwhile, offers 20% less performance but sells for 60% less than the line's previous low-end system, the Nova 3/4, the spokesman explained.



Data General's Nova 4/X, one of three recent additions to the Nova line, packs a CPU on one board and provides up to 15 chassis slots for memory I/O.

Although DG reportedly plans to continue selling its three Nova 3 family members, they will be effectively replaced by the Nova 4 systems, he added.

All three members of the Nova 4 series come with a choice of a five-slot or a 16-slot CPU chassis. The five-slot version of both the high-end 4/X and the mid-range 4/S reserves one slot for a processor board, an-

(Continued on Page 40)

Level 6 Memories Decline in Price

WALTHAM, Mass. — Honeywell, Inc. has cut by 15% to 49% the price of 16K-bit memory chips for its Level 6 minicomputers.

With the reductions, the price of a high-density Level 6 controller with a 64K-byte parity memory has fallen from $8,400 to $4,700. The price of an additional 64K-byte parity memory pack has dropped from $4,400 to $2,250, according to a Honeywell spokesman.

A controller with a 64K-byte error detecting and correcting (Edac) memory now costs $7,600 compared with $9,600 previously, while the cost of an additional 64K-byte Edac memory pack has declined from $5,000 to $3,800.

System Helps Save 'Dough' For Rising Bagel Baker

By Marguerite Zientara
CW Staff

W. HAVEN, Conn. — Even though its sales have jumped 45% during the last two years, a bakery here has cut its annual payroll by $4,700, and the company's managers attribute the savings primarily to their in-house minicomputer system.

Lender's Bagel Bakery, established in 1927, has experienced a sudden sales boom now that its main product, once considered an ethnic food, is growing rapidly in popularity. The company employs more than 200 individuals at three locations in New York and Connecticut.

Company Controller Al Shaiken credits his firm's payroll savings to "increased efficiency" brought about by the minicomputer system. "It was real drudge to record business statistics manually," he explained, "and now the information is more timely."

Before 1972, the firm used an outside computer service for accounts receivable and payroll functions and did many routine office functions manually.

"When we decided to purchase our own computer, we looked at a lot of systems, including equipment from IBM, Univac, Basic Four Corp. and Burroughs Corp.," Shaiken recalled. "We found at that time that the Basic Four system was the only truly on-line, fully integrated system. The others were either for batch processing or a mixture."

Bagel Business Rises

In 1972, then, the company bought a Basic Four Model 400, but the recent sharp increase in business dictated a need for faster throughput. So last August Lender's replaced the Model 400 with a Basic Four System 610.

Under its earlier DP systems, Lender's sent all its business and accounting data out of house to the service bureau. "There was a seven-day waiting period for payroll, and our accounting functions were at the mercy of a number of elements, including snowstorms," Shaiken noted. "Now, with the in-house system, we are in greater control. There's no lag in billing time and when we need information, we simply call it up on the computer's CRT terminal."

Lender's uses its mini for various applications including accounts receivable and payable, food brokers' commission statements and perpetual inventory. It also uses the system for specialty programs like recording maintenance and depreciation costs for various pieces of machinery and for generating sales analysis reports by product, territory and customer.

(Continued on Page 47)

Line Triples Printer Distance

SAN DIEGO — Users of Datasystems Corp.'s DLP-11 line printer controller can operate their printers more than three times farther away from their CPUs than before now that the company has introduced an optional long-line interface for the controller.

Compatible with Dataproducts Corp. printers, the external interface allows similar printers to operate more than 50 feet away from any Digital Equipment Corp. PDP-11 series minicomputer.

The DLP-11 long line option costs $200 and is available from Datasystems at 8716 Production Ave., San Diego, Calif. 92121.

DG Broadens Nova Line With Three CPUs

(Continued from Page 39)

other for main memory and the remaining three spaces for I/O boards.

With the 4/C, the five-slot chassis provides one slot for CPU and memory, which fit on the same board, and accommodates up to four I/O cards. The Nova 3/4, by contrast, accepts only one I/O board.

In the 16-slot version, both the 4/X and 4/S allocate one rack space for a CPU module and 10 spaces exclusively for I/O boards. Another slot accepts either a memory module or an optional floating-point unit, and the remaining four spaces hold either memory or I/O controllers.

The Nova 3/D, on the other hand, provides a total of only 12 board slots, including six for I/O.

With the 4/C, the 16-slot option reserves one space for a CPU board and the other 15 slots for I/O controllers.

Reliability Features

All three Nova 4 systems also offer assorted reliability and maintenance features not available with the Nova 3 line, the spokesman explained. Some of these features include internal diagnostics for CPU and memory, an off-line switching power supply, reduced interconnections and an optional battery backup unit that supports a full main memory complement for up to 90 minutes.

Moreover, the five-slot chassis versions of each model incorporate two 4.5-in. cooling fans, compared with four such units in the 16-slot chassis systems.

Other features shared by all three members of the Nova 4 line reportedly include an asynchronous terminal interface, automatic program load, optional hardware multiply/divide, hardware stack and frame pointer, direct memory access channel and 16-level priority interrupt structure.

Unlike the other two Nova 4 models, however, the 4/X incorporates a memory management and protection unit (MMPU) that permits users to address 32K to 256K bytes of main memory with four address extension tables including two program maps and two data channel maps, the source said.

Without the MMPU, the 4/C incorporates 16K to 64K bytes, while the 4/S expands from 32K to 64K bytes.

Both the 4/X and 4/S also provide a prefetch processor — a feature absent in the 4/C system. While the two largest Nova 4 CPUs are executing current instructions, the prefetch processor loads upcoming instructions at 20M byte/sec in a first-in/first-out (Fifo) buffer memory, the spokesman explained.

As a result, the 4/X and 4/S can typically execute a STORE instruction in 400 nsec and an ADD instruction in 200 nsec.

Performance Edge

The 4/C belongs in roughly the same product class as the Digital Equipment Corp. PDP-11/03 and 11/04, but provides an unspecified edge in price/performance, the source claimed. The 4/S and 4/X, by contrast, compare most closely to the PDP-11/34 and, like the 4/C, reportedly outperform their DEC counterpart by an unquantified amount.

DG partly attributes the Nova 4's performance edge over the DEC models and the Nova 3 line to four-way memory interleaving, which cuts typical memory cycle times to 400 nsec. Company officials also credit the performance improvement to a 56-bit-wide microword and to the optional floating-point feature, which is available only with the 4/S and 4/X.

Using the enhanced floating-point unit, the two largest Nova 4s can execute a double-precision STORE in 200 nsec and a double-precision ADD in 1.6 microsec, the spokesman said.

In a five-slot version, a 64K-byte Nova 4/C with an asynchronous interface, automatic program load and power fail/auto restart costs $3,500. A 16-slot, 64K-byte Nova 4/S with similar features sells for $7,600, and a 256K-byte 4/X with a floating-point processor, 16 chassis slots, 20M-byte disk unit, four Dasher 6053 CRT terminals and a 180 char./sec Dasher LP2 printer costs $56,886.

Deliveries of the 4/C begin in 180 days, compared with 90 days for the 4/S and 4/X. Data General is located at Rt. 9, Westboro, Mass. 01581.

EDP professionals have a word for the new Wang VS computer.

Richard Berger, Vice President and Data Processing Manager, Bughaus, Inc., a Volkswagen service center network headquartered in Hartford, Conn.

"Because we had been using a computer—the Burroughs B1700—with card input sequential files and no video displays, we suffered long delays and storage constraints.

"Now, with our Wang VS system, storage is virtually unlimited, and we simply recall a screen load of information on the CRT to make a change in seconds—all of this without interrupting our normal flow of work.

"We've put everything in our business onto our VS system, including payroll, accounting, sales and wholesale and retail inventory control. And we did it in 90 days without changing languages and with only minor modifications in almost 90 COBOL programs."

"We are absolutely amazed at the throughput rate we've achieved with our Wang VS. On our very first job for one of the country's largest student insurance agencies, the VS arrived in Pittsburgh on December 23 and was completely installed and operational on-site on February 15, with 61 programs written, debugged and tested—all by only two people—and not a single line of code had been written until the machine came in the door.

"The VS really fulfills all of our requirements, particularly in areas where other systems are weak: cost/performance, language-availability, user-utility software.

"I think the real key for the DP manager is the utilities available with the VS, its speed and its interactive COBOL compiler. These three things combined make for a very powerful tool."

J.P. Scott, Data Processing Manager, Aptech Computer Systems, Inc., Pittsburgh, Pa.

Kenneth W. Cakebread, Manager of Data Processing, Trans-Air Forwarding and Brokerage, Inc., Inglewood, Calif.

"I had 30 days to convert about 220 programs from our old batch-oriented Honeywell 62 system to our new Wang VS system. Not only did I do it: Thanks to the programming power of the VS, I actually came up with more.

"Before we converted to the VS, the biggest problem we had in the accounts receivable area was misapplying cash. No more. Now, by capturing current information and keying it into the computer from a workstation, we're able to sort out potential problems long before they get to the accounts receivable stage. And with Wang's on-line editing capabilities, I'd say we've cut our average editing time on a per-item basis from 30 seconds to a single second.

"And believe it or not, while the VS gives us faster access and maybe triple the programming efficiency of our old system, it was only half the cost."

EDP professionals in more than 100 companies are singing the praises of the Wang VS. And for good reason.

The VS is a remarkably sophisticated, fully expandable virtual storage computer designed to provide maximum interaction in a mainframe environment.

The VS provides for distributed data processing, thus avoiding costly consumption of mainframe resources. It's fast, responsive, ease to use and can support up to 2.3 billion bytes of on-line storage. What's more the VS speaks EDP people's language: COBOL, BASIC, RPG II and ASSEMBLER.

We also think you'll appreciate how simple the VS is to operate. In fact, because of its level of sophistication, it can be operated by people with little or no computer-related training or experience.

One more thing: the entry level price of the VS is under $50,000. Which is perhaps the most remarkable thing of all about this computer.

For more information on the VS, return this coupon to Wang Laboratories, Lowell, MA 01851.

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For video display, we offer the new VT100 terminal—with a combination of features no other video terminal can match: 132 column screen, detachable keyboard, split screen, reverse screen (white characters on black or vice versa), smooth scrolling, adjustable screen brightness, and line drawing capabilities.

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Which means you have the convenience and security of dealing with one vendor no matter how large your system grows.

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The PDT-11/130. Intelligence plus tape storage. When your need is for data capture with local storage capacity, the PDT-11/130 is an economical solution. It's a video system with processor, memory, and a dual minicartridge tape that stores up to 512,000 bytes of data.

The PDT-11/150. Intelligence plus disk storage. Our PDT-11/150 includes processor, memory, and single or dual floppy disk drive—with your choice of hard-copy or video display for your console.

The PDT-11 systems are available with all the software you need to generate your applications

in BASIC, FORTRAN, or MACRO. We also offer a forms package to help you format your video screen quickly.

The PDT-11 Cluster Concept. The hardware and software power built into the PDT-11 family gives you more flexibility than ever before in assembling remote workstations.

PDT-11 terminals are available with four plug-in ports, and you can select your peripherals either from within the PDT-11 family or from our line of hard-copy terminals.

For example, you might combine a basic PDT-11/110 with a Digital DECwriter printing terminal. While the printer produces hard copies for your permanent files, the display terminal can be used at full capacity for other operations.

If your application calls for multiple terminals, you can cluster up to three additional terminals around the PDT-11/110. Each terminal shares the intelligent terminal's processing power, and each acts as an efficient communications link to the host.

Clustering with our PDT-11/150 terminal is one of the most inexpensive ways to create multiple intelligent workstations. For instance, a PDT-11/150 with three VT100 terminals gives you four-way intelligence at an incredibly low cost. Less than $3000 per terminal.

Naturally, you can interchange units and expand your clusters as your requirements change. PDT-11 clustering power takes terminal intelligence wherever you need to go.

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- EIA Port for Local Printer
- Asynchronous/Synchronous Communications Port
- Optional Controller for up to 3 Additional Clustered Terminals
- Self-Test Diagnostics

PDT-11/130

- VT100 Based
- PDP-11 Compatible Processor
- 16Kb, 32Kb, 60Kb RAM Memory
- EIA Port for Local Printer
- Asynchronous/Synchronous Communications Port
- 512Kb Dual Tape Cartridge (Block Addressable)
- Self-Test Diagnostics

PDT-11/150

- Hard-copy or Video Console Terminal
- PDP-11 Compatible Processor
- 16Kb, 32Kb, 60Kb RAM Memory
- EIA Port for Local Printer
- Asynchronous/Synchronous Communications Port
- Single or Dual Floppy (256Kb/512Kb)
- Optional Controller for up to 3 Additional Clustered Terminals
- Self-Test Diagnostics

Cluster Terminals

VT100

- User Selectable 80/132 Column on 12" Screen
- Detached Keyboard with Numeric Keypad
- Screen Attributes: Split screen, smooth scrolling, reverse screen
- Character Attributes: Normal, double-width, double-size characters, underline or reverse (standard)
  Optional: Bold and blinking characters
- Editing Features Available

LA34 DECwriter IV

- 30cps Keyboard Printer
- Tractor Feed for Multi-part Forms Available
- Table-Top
- 4 Selectable Character Sizes

LA120 DECwriter III

- 180cps (max.) Keyboard Terminal Printer
- Forms Capability
- Numeric Keypad Available
- 8 Selectable Character Sizes

digital

Vendor Interest in Business DP Up

(Continued from Page 39)

easily than their Honeywell counterparts.

But DG partly offset this weakness by providing its business systems line with a common programming language — Ansi '74 Cobol — which allows users to transfer programs from one CS model to any other without recompiling.

Wang Laboratories, Inc. combined elements of both DG's and Honeywell's compatibility strategies when it expanded its small systems family with the WCS/50. Like the CS series, the WCS systems use a common programming language. But like the Level 6 equipment, the low-end WCS/50 upgrades to larger members of its family merely by accepting additional memory and I/O processors.

Hewlett-Packard Co. skirted the question of hardware and software compatibility when it introduced a small business systems family that uses multiple CPUs and operating systems. Like some of its competitors, however, HP recognized the need for a broad range of commercial offerings for business users.

Only a few months after introducing the low-end Model 250 and the high-end 3000 Series III, HP bridged the gap in its product line with two mid-range offerings — the Model 300 and the 3000 Series 33.

IBM, meanwhile, reinforced its dominance in the business computer sector when it announced major additions to its small systems line as well as enhancements to its existing offerings.

The industry giant opened the year with the introduction of its 5110 desktop computer, a disk-based version of the company's older and less powerful 5100, which uses magnetic tape as its mass storage medium.

A few months later came the announcement of the System/38, which provides an upgrade path for System/3 and System/34 users and which sports a raft of technological innovations, including RPG-III, compressed logic densities and 32K-bit memory chips.

In addition, IBM used the past 12 months to improve the networking capabilities of its small business systems line. First, the company enhanced its Series/1 with Cobol and a "communications attachment feature" that allows the system to link to 370 series and Series 30 processors. Then the firm announced enhancements that allow the System/34 to operate in a Systems Network Architecture environment.

Finally, the company introduced its Model 8100, which sports 64K-bit memory chips, offers unbundled system software and operates in 370-based distributed processing networks.

But while technology at IBM and elsewhere advanced at an unprecedented pace, some old and familiar bugaboos continued to defy solution. For many vendors, especially the fastest growing ones, service remained a major source of user complaints.

In general, mini vendors enjoyed much more success when faced with technological hurdles than when trying to tackle computing's more elusive human problems.

Board Bows

ORANGE, Calif. — Ninety-one 14- or 16-pin integrated circuit or socket positions can reportedly be accommodated by MDB Systems, Inc.'s wire-wrap half-board for Interdata, Inc. minicomputers.

Mechanically identical to its Interdata counterpart, the general-purpose board also provides .4-, .5- or .6-in. centers that accept circuits or discrete components with more than 16 pins.

The 7- by 15-in. half-board, which mounts in one Interdata CPU chassis slot, accepts almost any combination of sockets or integrated circuits with 14 to 60 pins.

The half-board costs $275, from MDB at 1995 N. Batavia St., Orange, Calif. 92665.

System Saves For Bagel Baker

(Continued from Page 39)

With the acquisition of the System 610, Lender's is automating additional applications, including weekly bagel sales reports for salesmen and a labor-vs.-production-cost report for management. "We're working on an inventory of ingredients control, which is a more complex report," Shaiken noted. "This will give us an idea of how effective our formulas are for producing bagels."

Lender's System 610 consists of four CRT terminals, a 72K-byte CPU, a 70M-byte disk unit and a 300 line/min printer.

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(WARNING: there may be more than one right answer to each question)

1. Model 85 is:

(a) a remote information system we first introduced in 1978.

(b) a distributed data processing product.

(c) a multifunction data processing product.

2. Its features include:

(a) multitasking for up to four applications.

(b) large disk capacity.

(c) modular configuration.

(d) more than these.

3. New improvements are:

(a) increased processor memory to 256K bytes.

(b) the addition of remote workstations and printers.

(c) increased disk storage to 100 MB.

4. Model 85 functions are:

(a) remote file management and high level language processing.

(b) on-line file management and stand-alone processing.

(c) batch communications and volume data entry.

5. Available languages are:

(a) RPG II.

(b) COBOL.

(c) ESPERANTO.

6. Model 85 saves users money as an alternative to:

(a) enlarging mainframes overburdened by network interactive applications.

(b) adding communications lines with greater capacities.

(c) maintaining a mainframe configuration only fully used at peak time periods.

(d) losing time and money due to mainframe downtime.

7. For more details on Model 85, you should:

(a) phone your nearest Data 100 sales office or one of the numbers we've listed.

Now check your answers.

All answers but these three are correct.

2a: Model 85 offers multitasking for up to *eight* applications.

3c: 100 MB is old figure; Model 85 is now *245.6 MB* disk storage.

5c: No. Model 85 doesn't speak it. Yet.

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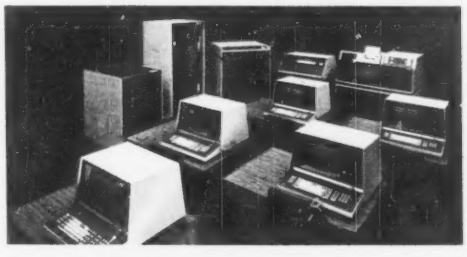

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Hobbyists' Glory Fading

Micros for Business to Star Next Year

By Ann Dooley
CW Staff

Two years ago, computer hobbyists were in their glory and the microcomputer market was theirs for the asking. In 1978, however, micro manufacturers began realizing the benefits of serving another master.

It had always been predicted that the personal computer — or hobby — market would peak and then level off to cater to a devoted group of interested hobbyists. While it was still too early in 1978 to know whether that market had peaked, the year did show the industry to be in a state of flux.

Equipment manufacturers began featuring more powerful, business-oriented systems rather than the do-it-yourself micro kits they had been offering to hobbyists who had the time and energy to build them.

Software companies followed suit with general business applications and fewer versions of "Star Wars." Although those companies had never really met all the hobbyists' needs, they accomplished even less in their attempts to provide business users with any kind of reliable, all-around software applications in the past year.

Many observers feel that is the major shortcoming in the micro industry and a situation that will need to improve significantly before micros become a viable product for business users.

The fact that the industry's very nature was changing was most obvious at the microcomputer shows. Those shows were once the backbone of the hobby market, where hobbyists would come to play with hundreds of different games and devices, wearing tee shirts and bringing a razzle-dazzle, slightly offbeat element to the shows.

Review & Forecast

But last year much of the razzle-dazzle was fading, and tee shirts were discarded in favor of three-piece suits. There were fewer gimmicks and whistle-blowing exhibits and more promotional literature.

The micro shows themselves seemed to suffer from the changing market. Because of the previous year's successes, a large number of shows were held throughout the country in '78; however, the attendees, for the most part, did not turn out in the same numbers. Attendance was down dramatically at personal computing shows in Dallas, Chicago and Philadelphia.

Different Styles

The problem seemed to be that business people do not shop the same way that hobbyists do. While the hobbyist has a working knowledge of computers and is content to play with a system, talk to the salesperson and make a purchase, the business user wants to know what the system will deliver and doesn't really care how it does so.

In addition, the small business user usually knows very little about computers and cannot learn in the 10 minutes or so an exhibit salesperson can spend with each customer.

The manufacturers also found themselves in a quandary. Since it was not economically feasible for them to appear in all the regional shows, they had to pick and choose, taking the risk of picking the poorly attended ones.

In 1978, business people increasingly seemed to turn to computer retail stores when they were considering buying a computer.

One of the most significant events in 1978 for micros was the opening of a micro computer retail store in Manchester, N.H., by Digital Equipment Corp., the first such large manufacturer to enter the retail market.

That store will undoubtedly prove to be the forerunner of others in the year ahead. DEC itself plans to open additional stores, and Radio Shack — which firmly held the lion's share of the micro market last year — already has a strong retail network.

The major retail department stores, such as Sears Roebuck and Co., will also divert a large portion of sales from the computer stores when they begin retailing microcomputers. This leaves computer store owners facing a lot more competition as they try to attract prospective buyers, industry observers said.

While the industry last year didn't completely abandon the hobbyists, it is clear the manufacturers will go where the money is — with the business user.

Microsoft Has Fortran Compiler For Radio Shack TRS-80 Users

BELLEVUE, Wash. — A Fortran and Assembly language software package that includes the Microsoft, Inc. Fortran-80 compiler, macro assembler, text editor and linking loader is now available for Radio Shack Corp.'s TRS-80 from Microsoft.

In addition to Fortran capabilities, the package provides the first Assembly language development tools for TRS-80 disk systems, Microsoft claimed.

The editor allows the creation of assembler source files, data files and Fortran files. The Z80 macro assembler has a complete macro facility, full set of conditionals and relocation pseudo-operations.

Fortran-80 includes all Ansi 1966 Fortran except the Complex data type, plus enhancements such as mixed-mode arithmetic, logical operations on integer data, encode/decode for format operations to memory and end-of-file and error condition trappings.

The TRS-80 Fortran package is fully compatible with the micro's disk operating system and is supplied on two minidiskettes. A TRS-80 with a minimum 32K-byte disk system is required. The package costs $350 from Microsoft, Suite 819, 10800 N.E. Eighth, Bellevue, Wash. 98004.

Courses Set in Three Cities

WASHINGTON, D.C. — George Washington University here has planned several short courses in microprocessors aimed at engineers and managers who are currently using or planning to use microprocessors.

The courses are designed to give users a better understanding and appreciation of the microprocessor by examining terminology, concepts and potential applications.

The courses will be held at the Sheraton-Houston Hotel in Houston, Texas, on Jan. 17-19; at George Washington University, Feb. 7-9; and at Biscayne College in Miami, Fla., March 7-9.

Each course costs $405. Further information is available from the Continuing Engineering Education Program, George Washington University, Washington, D.C. 20052.

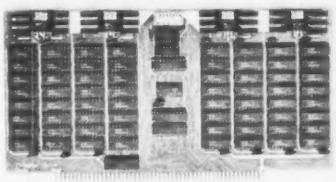
S-100 Gets Memory Board

BERKELEY, Calif. — The Superram, a 32K static random-access memory (RAM) board, has been introduced by Thinker Toys as the latest in its line of S-100 memories.

The board uses the National Semiconductor Corp. Model 5357 or the Texas Instruments, Inc. equivalent Model 4044 4K by 1-byte NMOS memory chips. It can be run at 2 MHz for standard 8080 systems or 4 MHz of Z80 systems, the firm said.

All control signals, addresses and data lines are fully buffered, according to a spokesman. Each 16K block is independently addressable and write protected.

The board contains seven support integrated circuits and the typical power consumption is 2.6A, he said.



Thinker Toys Superram

The board was designed to meet the proposed IEEE S-100 standard and will work with any computer meeting thise specifications, Thinker Toys noted. The Superram costs $649 in kit form and $699 assembled from the firm at 1201 10th St., Berkeley, Calif. 94710.

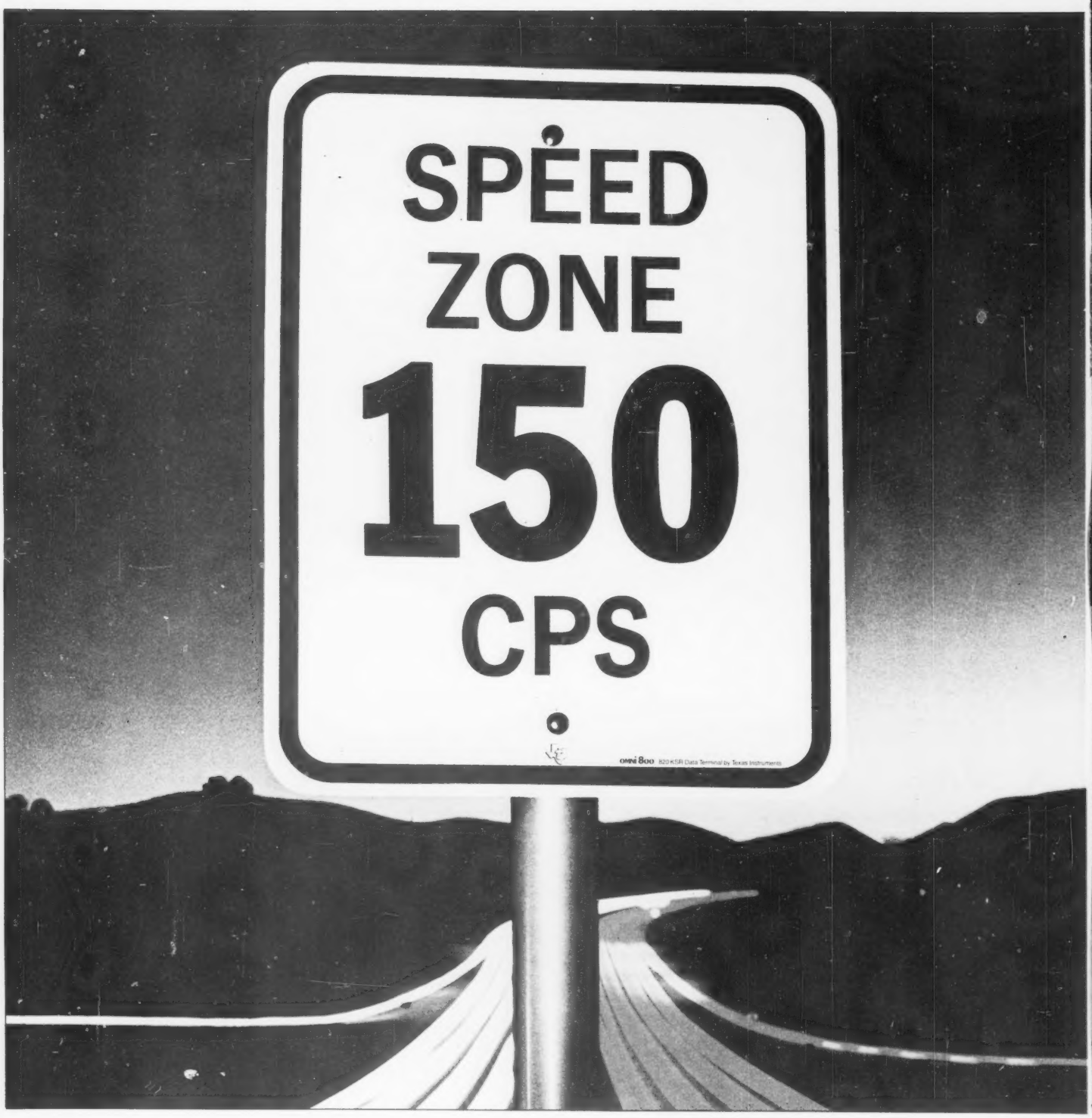
Video Boards Tied With Applications

EUGENE, Ore. — Forethought Products has introduced the 6502 Video Driver Routine (VDR) which provides software support for memory-mapped video boards to allow them to be interfaced to applications programs, assemblers, Basic interpreters and so forth, the firm said.

The VDR manages cursor movement, line and page overflow, scrolling and control functions. Programmable mode control is maintained over the video board so that graphics, Greek and reverse characters can be displayed on boards so equipped.

The 6502 also includes facilities for scrolling speed control, printer control and partitioning of the screen into protected areas, the firm said. The 6502 VDR was designed for S-100 video boards of 16 lines by 64 characters but can be easily adapted to 32-character boards as well, the firm stated. The software is provided on a KIM-compatible cassette tape.

The 6502 VDR costs $950 from local stores or direct from Forethought Products, 87070 Dukhobar Road, Eugene, Ore. 97401.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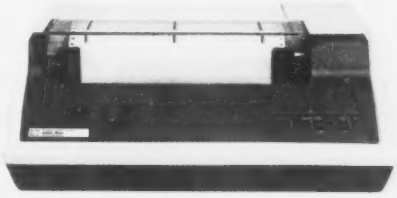
The 820 comes with standard equipment that is setting new industry standards: 150 characters-per-second optimized bi-directional printing, adjustable wide carriage, 9 x 7 dot matrix character font, a full 128-character ASCII keyboard, Answerback Memory, a "last character view" mode, self-testing capabilities, a three-digit L.E.D. Terminal Status Control panel, and impact printing at less than 60 decibels. Optional equipment includes compressed character printing, a full ASCII/APL keyboard, and an 18-key numeric cluster.

The other member of the Family, the 810, has an outstanding track record for price/performance.

The 810 receive-only printer has a reliable, low-cost printhead with a 150-million-character life. As well as optimized bi-directional printing, 9 x 7 dot matrix format, self-test capability and a variety of user-oriented options for added flexibility.



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'Big Print' For Micros

SAN RAFAEL, Calif. — Users of 8080, Z80 and 8085 microprocessors can now use an applications program called Big Print to print large block characters and create any message on 14-7/8-in. paper.

Upper and lower case letters, numbers and 27 special characters are available.

To use the program, a minimum 12K bytes of random-access memory (RAM) is needed plus Solos Cuter processor technology and a 132-position printer. Object code is distributed on cassette for $29.95 plus 6% sales tax from the Computer Demo Room, Inc., 509-B Francisco Blvd., San Rafael, Calif. 94901.

Line-Oriented Text Editor Aimed at 8080, Z80 Users

BELLEVUE, Wash. — Microsoft, Inc.'s Edit-80, a random-access, line-oriented text editor for 8080 and Z80 systems, is the first microcomputer editor with random line access to floppy disk files, according to the firm.

The editor reportedly provides almost instantaneous access to any record of a file, even if the available memory space is considerably smaller than the file being edited.

The Edit-80 supports a full range of editing commands as well as automatic line renumbering, global find and substitute and multiple page files. Edit 80's Alter Mode provides a complete set of intraline subcommands to edit portions of individual lines.

The Edit-80 text editing package includes a file compare utility program called Filcom, which compares source or binary files and outputs differences between them.

Edit-80 runs on any 8080 or Z80 system with the CP/M operating system and costs $120, Microsoft said from Suite 819, 10800 N.E. Eighth, Bellevue, Wash. 98004.

Betsi Links Pet to Bus

EUGENE, Ore. — Forethought Products is now offering its Betsi interface/motherboard that links Commodore Business Systems, Inc. Pet to an S-100 bus on an off-the-shelf basis.

In kit form, Betsi costs $119 and includes one S-100 connector; it costs $165 assembled and tested with four S-100 connectors.

Forethought Products is at 87070 Dukhobar Road, Eugene, Ore. 97402.

SSM Unwraps Video Board

SANTA CLARA, Calif. — SSM is offering users the VB2, an I/O-controlled video interface board that has its own keyboard input port, eliminating the need for any further I/O boards for either keyboard or video display, the firm said.

The display is in all upper case letters as well as numbers and symbols and is switch-selectable for white-on-black or black-on-white. Character width, horizontal margin and vertical position are adjustable.

The VB2 costs $149.95 in kit form and $189.95 assembled. Further information is available from SSM (formerly Solid State Music) at 2116 Walsh Ave., Santa Clara, Calif. 95050.

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Book Evaluates Books on Micros

ANN ARBOR, Mich. — A paperback book, *Getting Started With Microcomputers*, provides an evaluation of 25 books and periodicals on current technology and equipment and recommends each for its usefulness to the programmer, engineer or systems designer.

The free book includes a buyers guide with current prices and capabilities of home computers.

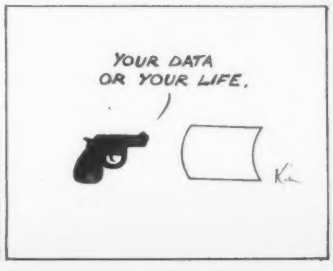
The book is available from NCE/-Compumart, Inc., P.O. Box 8610, Ann Arbor, Mich. 48107.

Memory Goes Up to 64K Bytes

WESTLAKE VILLAGE, Calif. — Designed for Intel Corp.'s intellec MDS 800, SBC 80/10, SDK-86 and BLC 80/10 microcomputers, the Chrislin Industries, Inc. CI-8080 memory module features expansion to 32K, 48K or 64K bytes on a single board.

The memory is compatible with both 8-bit and 16-bit Multibus-based systems, the firm said. The unit was designed to plug directly into the memory slot of the MDS 800 and the SBC 80/10.

The 16K-byte by 8-bit unit costs $390; the 64K-byte by 8-bit unit is $890 from Chrislin, 31312 Via Colinas, No. 102, Westlake Village, Calif. 91361.



CI Notes

National Semi Eyeing French Joint Venture

SANTA CLARA, Calif. — National Semiconductor Corp. and Saint-Gobain-Pont-A-Mousson have agreed in principle to form a joint-venture company in France to manufacture MOS integrated circuits (IC).

The agreement — subject to approval by the boards of both companies — would give National Semi 49% and Saint-Gobain 51% interest in the firm.

The initial capital outlay for the IC venture will amount to about $16.2 million, National Semi said. The complete project, including working capital, will represent an investment of about $115.2 million over the first five years.

During that period, The French government will subsidize the new company with a long-term loan and an advance to acquire technology from National Semi.

If approval for the venture comes in the first quarter as expected, construction of the IC manufacturing facility will begin in 1979 for start-up before the end of 1980. The exact location in France has not been determined. Plans call for the IC firm to begin with a staff of 200 to 300 employees and increase the work force to about 500 by 1985.

Stockholder's Suit Against CDC Dismissed by Minneapolis Judge

MINNEAPOLIS — A stockholder's suit which sought to order top executives of Control Data Corp. to pay about $1.7 million back to the company was dismissed here by Federal District Judge Edward J. Devitt, who ruled the case was not in CDC's best interest.

The suit, filed by Arthur Abbey, sought to hold high-ranking officials at CDC responsible for the fines and penalties incurred after CDC pleaded guilty last April to charges that it had made illegal foreign payments.

In granting the summary judgement, the judge noted that a special litigation committee set up by CDC's board of trustees to study the matter determined "that this action is not in the best interest of Control Data . . . Given the impeccable credentials of the committee members and the thoroughness of their investigation, it would be impossible to establish bad faith or lack of independence on the part of the committee."

After extensive examination of the issue, incuding lengthy interviews with the seven executives involved, the committee concluded that "none of the seven individuals authorized or had any contemporaneous knowledge of the events which ultimately formed the basis of the criminal charges brought by the U.S. government."

Past Year in DP Industry Not Easy to Categorize

By Marcia Blumenthal
CW Staff

Summing up the computer industry over the past year is like trying to squeeze a jumping jack back into its box; the agility of the coils make Jack difficult to fit into a neat package.

Tidy dollars and cents may be the best jumping-off place. Quarterly financial reports heralding record earnings and revenues were generally the rule. Mainframers had banner quarters.

For each of the first three quarters of the year, Amdahl Corp. posted earnings increases of 89% or better. At one time or another during the various quarters, Itel Corp.'s earnings advanced 54%; NCR Corp. boosted earnings by 44%; and Honeywell, Inc. swelled its earnings 49% compared with the year-ago quarters.

Although the financial picture was generally exuberant, some companies began experiencing earnings pinches during the year as prices of products dropped and operating costs escalated.

IBM seemed sluggish for the first two quarters. Earnings increases hovered at 5% or less above 1977 levels. But the behemoth rallied during the third quarter, showing an 18% increase in earnings compared with its 1977 third quarter.

While IBM's posture for the first half of the year seemed quiescent, during the fourth quarter it crackled with an aggressive move into distributed data processing and price cuts of Series 30 add-on memory that inspired speculation among competitors and industry observers.

While most firms were experiencing record years, ominous signs began clouding the economic future during the third quarter. The highs of the stock market in August

Review & Forecast

and September gave way to double-digit interest rates and talk of recession by October. Stock prices began dropping.

Speculation on the state of the economy permeated the industry throughout the fourth quarter. Most companies in the computer industry did not expect a major downturn in the industry, but recession became a serious topic of conversation in executive suites.

Isolated incidents such as Data 100 Corp.'s abandonment of the OEM printer market and Control Data Corp.'s sudden decision not to market its first intelligent terminal, the C-760, caused second guessing about those segments of the market.

Other economic issues of capital formation and investment in R&D continued to be hot topics in industry associations. The passage of the Revenue Act of 1978, aided by the lobbying of various industry groups, reduced the maximum capital gains tax from 49% to 28%. These new taxation rates were expected to be a boon to young high-

(Continued on Page 56)

GSA Head Sees Ceiling Tripled On Procurements by Agencies

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Federal agencies may soon be able to procure on their own authority DP equipment valued at up to $1 million, according to Frank J. Carr, commissioner of the General Services Administration's (GSA) Automated Data and Telecommunications Services (ADTS).

Presently, any system costing more than $300,000 must be approved by the GSA.

The increase to a $1 million ceiling will probably be made in about a year, by which time GSA will have been able to fully evaluate the program's success, Carr told a session of the Association for Computing Machinery's annual meeting held here earlier this month.

Carr said the program, which now gives agency management "blanket delegation" for procurement valued up to $300,000, has reduced agency procurement requests to GSA by 50%. At the same time, he said, it has only reduced GSA's procurement control by about 5% of the total amount of governmentwide procurements.

In addition, that delegation of authority does not mean agencies are not required to procure DP equipment on a competitive basis, he pointed out.

Giving agencies more direct control over procurements not only has had a "beneficial effect" on agency efficiency, but has also made ADTS more productive in its procurement activity, Carr said. GSA currently has a backlog of only nine agency requests.

Describing the program as a success, Carr

(Continued on Page 54)

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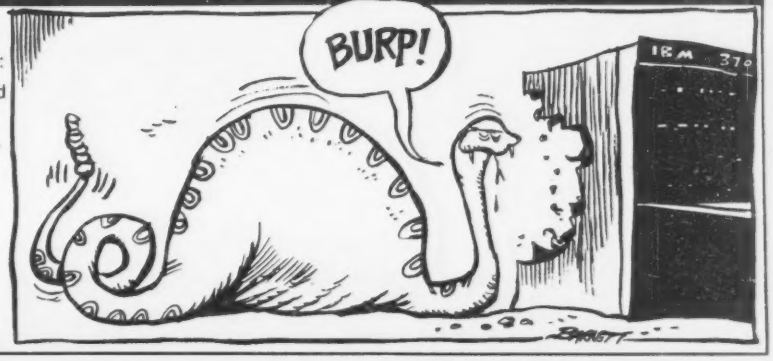

Higher Ceiling on Agency Procurements Seen

(Continued from Page 53)

admitted there remains "an awful lot to do in GSA" to make its procurement process more efficient. A major effort is under way at ADTS to establish policies to clarify the overlap of computer and communications technologies, he said.

Carr, the fifth head of ADTS in its five-year history, explained that his department was established to address just that problem. The "conversion" of the two technologies is "pretty much treated as if it were a new thing, even though its been around for a long time," he stated.

Classification Confusion

Much of the problem is caused by confusion over proper classification of computer and communications equipment, according to Carr, who explained that GSA has separate procurement regulations for the two types of equipment.

As an example of a classification problem, Carr noted computer terminals are obviously DP equipment but also, by their use in distributed DP, involve communications technology. A modem, he added, seems by definition to be a communications device, but often would not be procured if not for its applications in DP activities.

The problem is a "reflection not only of the changes in technology, but also the changes in market structure," Carr said, pointing to the entry of computer and communications equipment vendors into each other's traditional markets.

Discussing GSA's views on procurement activities in general, Carr paraphrased the late professional football coach Vince Lombardi, saying, "Competition isn't the most important thing; it's the only thing."

He added that "the thing that amazes me at times" is that some government personnel are directly opposed to that idea.

Mao's Philosophy

The task of GSA, he said, must be to make its procurement policy clear to government managers. On that subject, he went beyond the sideline exhortations of Lombardi to quote the philosophy of Mao Tse-Tung — "acknowledged as one of the great leaders of our time, irrespective of what you think of his political philosophy."

Brandishing a copy of the small, bright-red book of Mao's sayings, Carr said Mao believed policy is the "starting point" of any organization and is manifested in all of its actions. Before any action is taken, it is necessary to explain the policy to the members of the organization. Otherwise they will "act blindly" and not carry out the policy, Carr said, quoting Mao.

GSA's policy, he continued, is one of "optimum competition" and efficient procurements made in the "shortest possible time frame." To that end, the government must take bold action and avoid "paralysis by analysis." In addition, the most important thing is "to keep things simple."

Carr decried the complicated procurement requests GSA receives from agencies. Consisting sometimes of forms stacked "literally four feet high," many agency procurement requests don't adequately justify the need for greater DP capacity, he said.

The very long procurement cycles Carr has seen "have all tended to be the result of upstream failures to do adequate planning." Agency managers are not getting the right people involved at the right time in the procurement process, he stressed.

This is often the case in requests for noncompetitive, sole-source procurements, which in many cases reflect not a legitimate need for a certain vendor's equipment, but only a lack of planning by agency management, he said.

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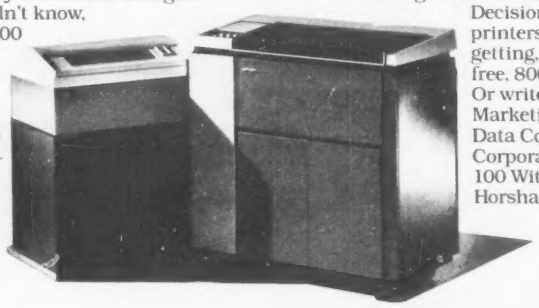

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Kierulff Agrees To Distribute CDC Peripherals

MINNEAPOLIS — Control Data Corp. and Kierulff Electronics, Inc. have reached an agreement that provides for the purchase and distribution by Kierulff of selected CDC OEM computer peripheral products throughout the U.S.

Under the terms of the agreement, Kierulff initially will purchase and distribute CDC memory modules, several models of flexible disk drives and their magnetic recording media.

In the future, the agreement may be expanded to include other OEM peripheral products for the minicomputer and microcomputer markets, the companies said.

Advantages of the distribution agreement for its customers, Kierulff said, include off-the-shelf delivery of products from inventory stock at its 12 nationwide distribution centers and the availability of Kierulff technical product support at these centers.

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OMB Policy Cited

Government Shift to Private-Sector DP Urged

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The federal government should be using the computer services industry much more and relying on in-house DP capabilities much less, several industry representatives told the recent annual meeting here of the Association for Computing Machinery (ACM).

Policy guidelines spelled out in the Office of Management and Budget's (OMB) Circular A-76 state that federal agencies — with a few exceptions — must rely on private contactors for DP services, according to Peter Loux, a member of the Association of Data Processing Service Organizations (Adapso). However, "the intent of the A-76 policy is not seriously being applied" in the government and is often "loosely interpreted in favor of the in-house alternative," he said.

Congress has been looking into "reliance on the private sector" for services of all kinds since 1932, Loux noted. A-76 calls for the government to contract with private firms for DP services except when the services are not available commercially or would be more expensive than in-house facilities.

National security considerations are another limiting factor, Loux pointed out.

If that policy were more closely followed, he said, DP services firms would be doing a lot more business with the federal government. Loux blasted OMB, the General Services Administration (GSA) and other agencies that direct federal DP activities for ignoring the policy he said is clearly stated in the A-76 guidelines.

Positive Development

In fiscal year 1977, DP services such as maintenance, programming, operations and time-sharing accounted for more than 26% of all the dollars spent on federal DP, according to figures supplied by Lance Swann, a member of the National Council of Technical Service Industries (NCTSI).

NCTSI is a group of firms that are major contract suppliers of services to the government. The group, like Adapso, is pushing the government to make more use of the private sector for DP services.

One positive development in that direction, Swann said, is that GSA is working to improve its Teleprocessing Services Program (TSP). The program, which certifies companies to supply time-sharing services to federal agencies, was "designed to allow agencies to easily use remote processing" but, in practice, has been found to be "very cumbersome," he contended.

Swann also noted that although agencies can now procure DP equipment valued up to $300,000 without GSA authorization, that ceiling does not apply to DP services. NCTSI is working with Congress, OMB, GSA and other entities to correct that lack of "equivalency" in the procurement process, he said.

In general, Swann stated, the policy outlined in Circular A-76 can benefit both the government and private industry. The DP services industry, he said, "can provide an economic alternative" to in-house government facilities.

In addition, President Carter's goal of controlling the growth of government by controlling government employment will benefit the service industry, he said.

Why DP Services?

Besides strengthening the free enterprise system, government reliance on the private sector offers a number of benefits for federal agencies, Swann maintained. He said the government should use commercial DP services because:

- DP services provided by private contractors are more cost-effective "in the long run" in that the user only pays for the services he needs when he needs them.
- Private companies offer a greater variety of capabilities than those available to a federal DP manager who has only his own system with which to work.
- The DP equipment available will not become obsolete. A services firm could not stay in business if it did not keep up with the latest technology, Swann said.
- There are fewer personnel problems for the government; DP managers can focus more on productivity and less on personnel management.
- Agencies can implement their DP projects more rapidly because the equipment and staff are already available. Managers do not have to worry about long procurement cycles or staffing problems.

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Past Year in DP Industry Hard to Categorize

(Continued from Page 53)

technology firms looking for capital.

But investment in R&D still needed a boost, even though a recent survey showed computer firms are among the heaviest investors in R&D.

Mergers and Acquisitions

Mergers and acquisitions continued at a steady pace in 1978. The surprise takeover of Data 100 by Northern Telecom Ltd. after a bid-off with McDonnell Douglas Corp. contrasted with the matter-of-fact acquisition of Quantor Corp. by NCR.

At year's end, negotiations for several mergers or acquisitions were under way. Microdata Corp. and Addressograph-Multigraph Corp. were talking, and Telenet Corp. and General Telephone & Electronics Corp. (GTE) had agreed in principle to Telenet's acquisition by GTE.

Without actual takeovers, competitors across industry segments began invading each others's domains. At least six companies introduced IBM 370-compatible processors. Some mainframers, such as Honeywell, Inc. and IBM, intensified their efforts in the small-scale end of the market. Itel Corp. and Amdahl Corp. led the way as equipment manufacturers made inroads into software development. With the unbundling of software for its 8100, IBM will, it seems, place greater emphasis on software as a revenue producer.

Companies in the service industry began marketing minicomputer systems, turning the "in-house minicomputer" threat into a business opportunity. Automatic Data Processing, Inc., Keydata Corp. and National CSS, Inc. were early entrants into the mini market, followed later by Scientific Time Sharing Corp. and General Electric Co.'s Information Systems Division.

Mohawk Data Sciences Corp. identified the services segment of the industry as a prime target for its small business systems.

New competitors entered the network business — AT&T with its proposed Advanced Communications Service and Xerox Corp. with its Xerox Telecommunications Network.

This cross-fertilization of markets will probably spawn plenty of new business for lawyers. Industry suits continued to proliferate, and five companies are now in the process of suing Data General Corp. Most litigants claim DG is trying to prevent them from marketing a Nova-compatible processor.

National Semiconductor Corp. sued Digital Equipment Corp. in a move to clear the air for marketing a processor compatible with DEC's PDP-11/34.

The U.S. vs. IBM antitrust trial waxed on, but the Memorex vs. IBM antitrust case ended in a hung jury, giving IBM a psychological victory — at least until Memorex's appeal is decided.

International Scene

On the international scene, threats from the Japanese were still on the mind of industry executives. Although the Japanese government stated it will make its markets more competitive for U.S. vendors, that intention did not become a reality.

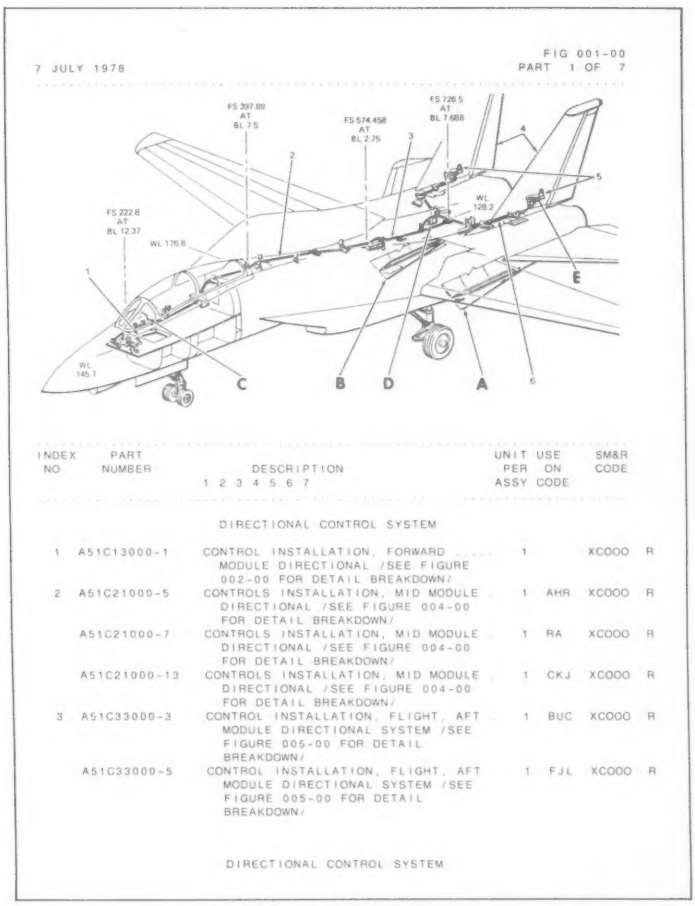
For the time being, the Japanese are making inroads into components rather than equipment. Industry participants consider the sales and service capabilities of the Japanese still too fragmented to seriously undermine U.S. equipment and services vendors.

Transborder data flow was an issue that cropped up repeatedly during the year. U.S. firms in the services industry saw some tactics of France, Japan and Canada as designed to prevent U.S. firms from competing in those markets.

Increased pressure on Congress by industry associations for restrictions on foreign firms setting up offices in the U.S. is expected.

Despite the economic uncertainty predicted for 1979, the U.S. computer and office equipment industry contributed a favorable balance of trade of $1.99 billion for the first nine months of the year. That was a 16% increase from last year's favorable trade balance.

And the computer industry came of age as the Charles Babbage Institute and the American Federation of Information Processing Societies embarked on projects to record its history.



7 JULY 1978 FIG 001-00 PART 1 OF 7

INDEX NO	PART NUMBER	DESCRIPTION 1 2 3 4 5 6 7	UNIT PER ASSY	USE ON CODE	SM&R CODE	
		DIRECTIONAL CONTROL SYSTEM				
1	A51C13000-1	CONTROL INSTALLATION, FORWARD ..... MODULE DIRECTIONAL /SEE FIGURE 002-00 FOR DETAIL BREAKDOWN/	1		XCOOO	R
2	A51C21000-5	CONTROLS INSTALLATION, MID MODULE . DIRECTIONAL /SEE FIGURE 004-00 FOR DETAIL BREAKDOWN/	1	AHR	XCOOO	R
	A51C21000-7	CONTROLS INSTALLATION, MID MODULE . DIRECTIONAL /SEE FIGURE 004-00 FOR DETAIL BREAKDOWN/	1	RA	XCOOO	R
	A51C21000-13	CONTROLS INSTALLATION, MID MODULE . DIRECTIONAL /SEE FIGURE 004-00 FOR DETAIL BREAKDOWN/	1	CKJ	XCOOO	R
3	A51C33000-3	CONTROL INSTALLATION, FLIGHT, AFT . MODULE DIRECTIONAL SYSTEM /SEE FIGURE 005-00 FOR DETAIL BREAKDOWN/	1	BUC	XCOOO	R
	A51C33000-5	CONTROL INSTALLATION, FLIGHT, AFT . MODULE DIRECTIONAL SYSTEM /SEE FIGURE 005-00 FOR DETAIL BREAKDOWN/	1	FJL	XCOOO	R
		DIRECTIONAL CONTROL SYSTEM				

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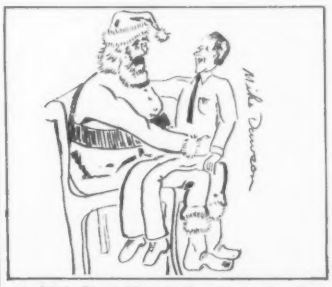

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Semi Outlook Uncertain

Although predictions on the state of the economy next year vary considerably, recent indications are that the semiconductor industry is getting edgier about its prospects.

As reported in a recent article in *Forbes*, Charles E. Sporck, president and chief executive officer of National Semiconductor Corp., said he has seen an increased amount of "double ordering" — often an indicator of bad times ahead for the semiconductor industry.

Double ordering was reportedly a significant factor in the industry in 1974-1975.

Wall Street observers, too, are becoming concerned. After a period of recommending semiconductor stocks, several analysts have lately turned bearish on them.

One industry analyst said backlogs are running at a rate that would imply a 50% growth rate for the industry. Even in boom times, this would be unlikely.

Within the semiconductor industry itself, executives are unable to agree. Several high-level managers to whom *Computerworld* recently spoke expressed varying degrees of confidence in the economy

Dealers' Market At $1.5 Billion, CDA Reports

PHOENIX — The market shared by brokers, dealers and lessors which are members of the Computer Dealers Association (CDA) has grown to more than $1.5 billion, according to William S. Grinker, the CDA's newly elected president.

With the election of an additional 42 members during the past year, CDA's membership has grown to 101 members, up from 11 members when organized in 1971, Grinker, executive vice-president of American Used Computer Corp., said.

"The significant development accompanying our [organization's] accelerated growth is that CDA now represents almost the entire domestic used computer industry," Grinker told attendees at CDA's annual convention, held here recently.

"But used computers comprise an international market," he noted. "Moreover, the present exchange rates favor acquisition of U.S. computer equipment by foreign companies."

CDA is now expanding its membership on a worldwide basis and has admitted computer lessors as full-time members. Lessors were previously granted associate member status.

Companies with business related to the computer industry but which are not equipment dealers or lessors are now eligible for associate membership.

Aside from Grinker, the other 1979 CDA officers are Kenneth A. Bouldin, president of Econocom, CDA chairman; Robert Kendall of Leasing Dynamics, Inc., treasurer; and Ronald Breckner of Data Sales Co., Inc., secretary.

Vice-presidential posts for 1979 are being filled by Richard Baker of Dataware, Inc.; Nick Cicchitti, NVC Computer Sales, Inc.; William Roselius, Computer Sales International, Inc.; Stuart Rubenstein, IOA Data Corp; and Harvey Berlent, Berlant Industries, Inc.

With the expansion of its activities, "CDA can serve as the industry spokesman with vendors, government agencies and the communications media," Grinker stressed.

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Why a "Big" TP Monitor is Really Better:

Some of the most popular TP Monitors have traditionally been "mini" or small-scale systems.

These products are simple to install and easy to use, while providing a limited set of features that work well.

Yet, while these products have some of the highest ratings in recent DATAPRO surveys, they also are replaced most often, because they were not able to keep pace with users' rapid growth and expansion.

In addition, they offer at best limited programmer-supported multi-threading, so performance suffers even more as volume increases. Finally, they lacked the full set of features users quickly find absolutely necessary. Some of these important features include automatic file recovery, on-line programming, RJE, integrated DBMS support with synchronized recovery, test and debugging aids, plus all of the vital pre-programmed utilities.

However, alternatives to mini-systems do exist — complex full-feature systems. Most can achieve acceptable performance in higher volumes, particularly those that provide reentrant COBOL and other necessary performance options. And most have the basic set of features necessary to implement complete TP Systems.

Unfortunately, many of these complex systems are notorious for lengthy installations (after many weeks), extensive education requirements, and time-consuming staff start-up times. Further, these systems invariably require one or more dedicated systems programmers for maintenance, tuning, "firefighting" and installing endless enhancements.

Obviously, there had to be a better way. There is, and it is called SHADOW II. SHADOW II combines the full features and top performance of complex systems, with easy-to-use reliability usually associated with mini-systems.

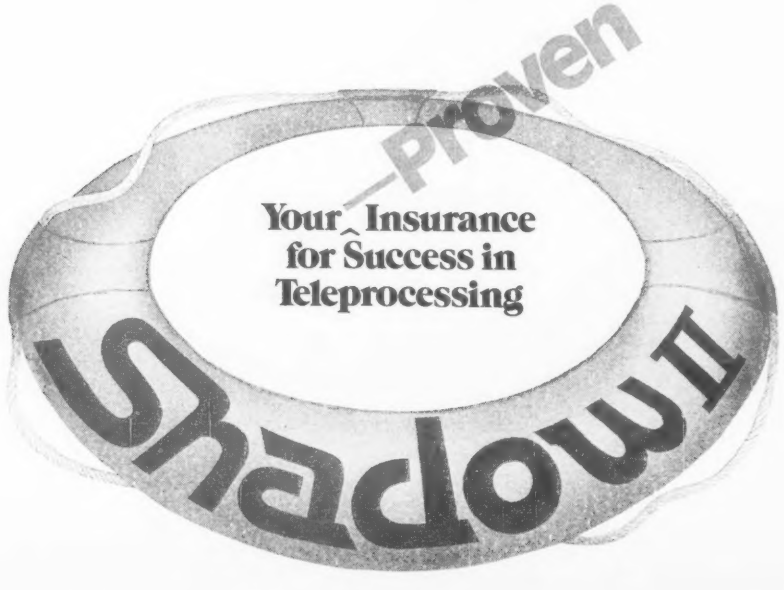
Judging from SHADOW II's acceptance in the marketplace, it is the right product at the right time.

Here's How We Document Our Claims

If a product is as good as we think it is, you should expect a lot of proof. For example:

1. **Datapro Software Honor Roll**
   SHADOW II achieved the Datapro Honor Roll in its *first full year* of marketing in the United States by Altergo.
2. **Success**
   First introduced in Europe, SHADOW II rapidly rose to the best-selling TP monitor against the toughest competitors. SHADOW II is quickly developing a similar reputation in the U.S.
3. **Benchmarks**
   We have numerous empirical user benchmarks proving the superior performance and reduced computing resource requirements of SHADOW II vs. CICS and other monitors.
4. **Support**
   Altergo's commitment to support is demonstrated by our eight fully-staffed support offices throughout North America.
5. **Conversion Experience**
   The acid test of true superiority of a product is a large base of users who converted from something else. Nearly 50% of over 250 SHADOW II users converted from other TP systems such as CICS. Obviously, these experienced, sophisticated users demanded a significantly better product to justify conversion.
6. **Demonstration**
   The real proof is on your own machine. Since SHADOW II is so easy to install and use, we are more than happy to oblige with an on-site demonstration!

See for yourself why SHADOW II is as good as we — and the industry — think it is!



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To our users, we say "Thank You" for your confidence. To those considering a TP monitor, we remind you that award-winning products are only winners if they perform. You owe it to yourself to see how SHADOW II can work for you.

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Northern Telecom Revamps Sales Organization

MINNEAPOLIS — Northern Telecom Systems Corp. has consolidated the U.S. sales and service organizations of Data 100 Corp. and Sycor, Inc. and made a series of marketing appointments.

In making the announcement, John C. Lobb, chairman and president of Northern Telecom, said, "In integrating the domestic sales and support activities of both companies," we believe that the corporation can more profitably exploit current and future market opportunities and can, at the same time, provide users with a much broader range of information processing equipment backed by a single, cohesive organization."

The new organization will have approximately 300 people in field sales, 200 in systems engineering and 1,200 in field engineering.

The recent Northern Telecom Systems appointments include Paul C. La Voie, senior vice-president of marketing; Anthony L. Fazio, vice-president of sales; Paul T. Cochlan, vice-president of field engineering; and John S. Cain, vice-president — marketing controller.

All marketing and support activities outside the U.S. will be the responsibility of E. Trevor Robinson, Northern Telecom Systems senior vice-president for international operations.

Northern Telecom Systems Corp. was formed earlier this year to manage Northern Telecom's computer-related businesses, including Data 100 Corp. of Minneapolis and Sycor, Inc. of Ann Arbor, Mich.

Other Moves

• Dennis M. Mannion has been named vice-president of operations at Documation, Inc.

• Alex Bernstein has joined the Brandon Consulting Group as a senior consultant.

• David C. Pixley has been named by the board of directors of Genesse Computer Center, Inc. as president and chief executive officer, and Kurt Enslein has been named senior vice-president and chief scientist.

• Robert B. Hawkins has been named executive vice-president of Control Data Corp.'s Computer Group. He will be in charge of managing the company's activities in international ventures and cooperative programs involving technology exchange.

• Paul J. Mozola has been named vice-president of the Midwestern region of Data Processing Security, Inc.

• Byrne O'Brien has been named director of administration and finance and Michael Nugent has been named staff attorney at the Association of Data Processing Service Organizations.

• Jack Robinson has been appointed regional marketing director for the Midwest and West Coast operations of Data Access Systems, Inc.

• Thomas Frenier has joined Dearborn Computer Co. as controller, Jack Hughes has joined as its manager for the Western region and Robert Meyer has joined as manager for the Northeast region. Another new employee, Robert Neumeyer, has been appointed product manager, and William Eick is the firm's new regional manager of software sales.

• Leland C. Fay Jr. has been named president of Evidex Corp., a Chicago-headquartered litigation support service company.

• John J. McElroy has been appointed president of Interactive Data Corp.

• R.E. (Bob) McKeon has joined ITT Courier Terminal Systems, Inc. as vice-president of field engineering.

• Daniel Toth has been named vice-president for communications industry marketing for the Infonet Division of Computer Sciences Corp.

• A.C. Rice has been elected to the board of directors of Tandem Computers, Inc.

• Juan A. Rodriguez has been appointed vice-president and general manager of Storage Technology Corp.'s Disk Division.

• Joseph J. Kroger has been named president of Univac's Marketing and Services Division and Paul J. Spillane has been named president of the firm's Products Division.

• Donald P. Stearns has been named national sales manager for the Peripheral Products Division of Datum. Inc.

• Jesse A. Simmons has been appointed vice-president and controller of Inforex, Inc. Robert J. Moore has been appointed senior vice-president of the firm.

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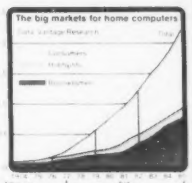

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Bradford to Develop Parent-Tracing System

NEW YORK — Bradford National Corp. has signed a long-term contract to develop a model computer system that will aid states in locating and billing absent parents who fail to make legally mandated child support payments.

The contract was awarded by the Office of Child Support Enforcement in the U.S. Department of Health, Education and Welfare (HEW). The model system is scheduled to be made available by HEW to child support enforcement agencies of interested states during 1979.

The contract award announcement was made by John W. Knight, senior vice-president of the Bradford subsidiary that will execute the contract.

"By assisting in the location of absent parents, billing them for child support and producing enforcement and management reports with appropriate privacy safeguards, the system is expected to significantly improve the effectiveness of state-administered child support programs and reduce government expenditures in this area," Knight said.

In recent years, child support welfare costs have soared, and the taxpayer has been forced to assume the fiscal responsibilities of many absent parents who have the financial capability to meet their obligations, he explained.

Extension of the program was described by HEW Secretary Joseph A. Califano Jr. as a contributing step in reforming the nation's welfare system. As the program goes into effect state by state during 1979, Califano said, it will aid HEW in reaching its goal of more than doubling the $423 million in child support collected by states from absent parents in fiscal 1977.

Bradford has been active in developing and/or operating such systems on a state-by-state basis since enabling legislation was first passed in 1975, Knight noted. It has provided such systems for Alabama, Massachusetts, Montana and North Carolina and currently Arizona.

Other Awards

Microprocessor Computer Systems Corp. has received a $60,000 contract for the sale of terminal equipment to Storage Technology Corp. The equipment will include teletypewriter terminals and Soroc IQ 120 CRT terminals.

Computer Sciences Corp. has received a contract from the General Services Administration to provide computer-related services to fulfill mission requirements of the Interagency Data Systems Facility, Huntsville, Ala. The contract is valued at more than $22 million over the full three-year period if all options are exercised.

Rockwell International's Electronic Systems Group has been awarded a $12 million contract by the U.S. Air Force for Transportable communications systems.

The U.S. General Services Administration (GSA) has awarded 11 contracts worth $25.6 million. Five of the contracts were awarded to small businesses: CPT Corp., Capitol Consultant Services, American Hospital Supply, Norward Industries Inc. and Alliance Rubber Co. Other contracts were awarded to Eastman Kodak Co., Addressograph-Multigraph Corp., Dictaphone Corp., General Electric Co., Tektronix, Inc. and Hewlett-Packard Co.

Several contracts worth $21.6 million have been awarded by the U.S. General Services Administration (GSA). Memorex Corp. received a $1.5 million order for tape, Wabash Tape Corp. got a $2 million contract for DP tape and Hewlett-Packard Co. gained a $6 million contract for data acquisition systems.

Cubic Corp. has been awarded two contracts totaling $13.7 million by the Hong Kong Mass Transit Railway Corp. for automated fare collection equipment.

Logicon, Inc. has received a $2.1 million Air Force contract to continue its work in the design and development of a new North American air surveillance system.

Ontel Corp., a subsidiary of Caesars World, Inc., has received an OEM contract valued at more than $1.5 million from Control Data Corp. The contract calls for a two-year shipment of the basic display terminal Ontel also uses in its proprietary OP-1 intelligent terminal system.

Computel System Ltd. has signed a major contract with Yamaha Motors Canada Ltd. of Toronto. Under the terms of the contract, Compütel will provide on-line services for Yamaha's order entry, invoicing, accounting and inventory control applications.

Contracts

Univac Corp. has been awarded a contract by the Internal Revenue Service Data Center in Detroit for a Univac 1100/82.

United Computing Systems, Inc. has received a contract from the Environmental Protection Agency for consulting services relative to the company's Inform-11 data management software package.

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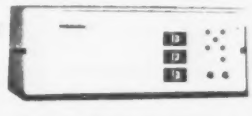
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Trade Shows Scheduled

WASHINGTON — France and Italy are ripe for imports of computer equipment, according to the U.S. Department of Commerce.

To give American manufacturers a piece of the action, the Commerce Department will sponsor a U.S. Business Equipment and Systems Exhibition in Paris June 5-8 and one in Milan — EDP/U.S.A. — June 19-22.

U.S. government market research studies indicate the French business equipment market is growing at 14% per year and could hit $1 billion by 1980.

Currently, imports supply 80% of this market and are likely to hold that share over the next five years, the Commerce Department said.

Similarly, only eight domestic manufacturers supply the Italian market for computers and related equipment — a market that is expected to climb from a current $529.2 million to $968.8 million by 1982, according to Commerce projections.

Great Potential

Small business computers and the personal/hobby computer market offer the greatest potential for U.S. sales in that country, the agency said.

More information about either show is available from the Commerce Department's Office of International Marketing, Washington, D.C. 20230.

GTE and Telenet Finalize $59 Million Merger Plans

STAMFORD, Conn. — General Telephone & Electronics Corp. (GTE) and Telenet Communications Corp. have reached an agreement in principle whereby GTE will acquire Telenet's outstanding common shares for approximately $59 million.

Shareholders controlling about 55% of the outstanding common stock have already agreed to an exchange of shares in the ratio of .7652 shares of GTE for each share of Telenet, the companies reported.

GTE said it does not anticipate any problem in acquiring the remaining 45% of the outstanding stock.

Furthermore, counsel for GTE has determined that approval from the Federal Communications Commission will not be necessary, a company spokesman said.

Telenet began its packet-switching service in August 1975. Sales for 1978 are expected to reach $9 million. The company's services are available in more than 170 cities in the U.S.

The merger is expected to be finalized during the first quarter of 1979, a GTE spokesman said, adding that GTE will most likely incorporate Telenet's operations into a new subsidiary.

Supershorts

National Computer Systems, Inc. (NCS) declared a 25% stock dividend on all outstanding common shares, equivalent to a five-for-four stock split. NCS also increased the quarterly cash dividend from 5 cents to 6 cents a share. Both cash and stock dividends are payable Jan. 2.

— — —

CSP, Inc. opened a regional sales office in Santa Clara, Calif., to market and provide technical support for its line of MAP array processors in 11 Western states.

— — —

The Microfilm Products Division of 3M Co. has acquired Photomedia Co., Inc., producer and distributor of vesicular film products for microcopying computer output microfilm.

— — —

Integrated Computer Systems, Inc., which provides technical education in applied computer sciences, has set up East Coast regional headquarters in Alexandria, Va.

— — —

Digital Equipment Corp. and Qume Corp. have named Tele-Data, Inc. as sales representative for part of their keyboard printer terminal lines. Tele-Data will sell and lease Decwriter 11 and Qume's Sprint 5 daisywheel terminals.

— — —

Wang Laboratories, Inc. broke ground for a $7 million, 250,000 sq-ft addition to its Tewksbury, Mass., facility that will produce computer processors and some peripheral devices. Slated for completion by June, the building will bring the Tewksbury manufacturing complex to more than 600,000 sq ft.

— — —

Hewlett-Packard Co. declared a regular quarterly cash dividend of 15 cents per common share, payable Jan. 15 to stockholders of record Dec. 27.

— — —

Pertec Computer Corp. (PCC) plans to buy about 85,000 of its own common shares over the next few months for distribution to employees under its stock purchase plan. PCC does not expect to acquire more than 100,000 shares in any six-month period.

— — —

California Microcomputer Co., Inc. signed a joint venture agreement with ACC Micro-Business Systems, Ltd. in England to assemble, distribute and service the U.S. firm's 7700 series of business computer systems in the UK.

Saving money by not doing it yourself

A guide to applications packages in January 29 Computerworld.

The increasing flexibility of the new software packages is rapidly making in-house development the exception rather than the rule of software planning. And more and more vendors are marketing easily convertible software packages to suit the time and budget needs of computer-users, large and small.

Applications Packages is the subject of our January 29 *Computerworld* Special Report, and in it we'll be examing many of the ways users are putting these newer, more flexible packages to work for them. Edited by Don Leavitt, *Applications Packages* will take a look at the increasing technological (and financial) feasibility of these new packages, and why they've become so attractive to users. We'll have vendors' stories as well, with articles on:

- *Software evaluation — choosing the right packages for the right system*
- *Cutting the costs of software maintenance*
- *Program conversion — is it worth the effort?*
- *"Firmware emulation"* and the technology behind portable packages.

If you're an MIS Executive, DP Manager, Supervisor or Lead Programmer, our January 29 Special Report will make some informative reading. And if you market programming products or services, here is a good place to put your advertising. Ad closing date is January 12, and your *Computerworld* representative can give you all the details. Or, to reserve space for your ad, call Terry Williams at (617) 965-5800.

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Cleveland-Cliffs is a major iron ore mining and processing Company with extensive interests in energy minerals, Great Lakes Shipping and other natural resources. We are offering an excellent opportunity for a growth oriented Programmer Analyst in our Michigan Mining Division Information Systems Department.

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Our Northern Michigan location of Ishpeming offers the advantages of a small town environment and the opportunity to enjoy many outdoor activities in beautiful surroundings. Marquette, 20 minutes away, provides a variety of shopping, cultural and educational facilities.

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Please submit resume with salary history and writing/editing samples to Ms. C. Purdy, Rm. 3C-333, Bell Laboratories, Corporate Headquarters, 600 Mountain Av., Murray Hill, New Jersey 07974. An equal opportunity employer m/f.

Bell Laboratories

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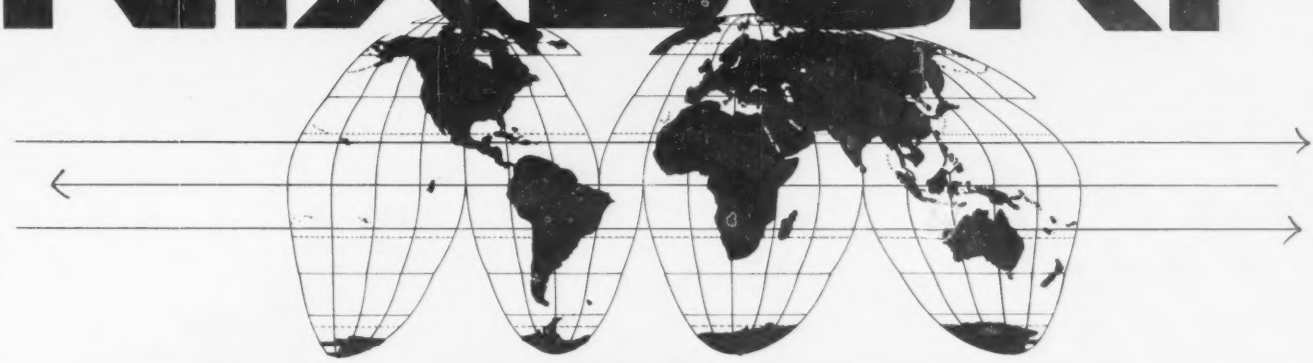

We're one of the world's leaders in the design, development, and manufacture of source data and distributed data processing systems, on-line interactive displays, remote batch terminals, data entry systems, and small business computer systems.

Our capacity to meet the challenges of new technology and applications have enabled Nixdorf to maintain a state-of-the-art environment and a rate of growth that well exceeds the industry average.

The key to Nixdorf's growth has been the development of hardware and software features that make our systems as simple as possible to operate and manage, and provide solutions to problems faced by large, high-volume customers that include insurance companies, major industrial corporations, government agencies, and service bureau organizations. Over 60,000 Nixdorf installations are currently at work in 28 countries around the world.

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Specific expertise is required in the following areas:

- **Communications (BSC, HDLC, X.25)**
- **File Management Sub System**
- **Compiler/Interpreter**

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Mini Computer Programmers

Background in systems software development, assembly language background preferred. Design, develop and debug mini-computer operating systems related to Word Processing, Source Data Processing, Data Entry and Distributed Data Processing.

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Experience in asynchronous/bisynchronous communications, HASP or SDLC, assembly language background preferred.

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Position includes systems design, coding, systems test and debug.

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Design, develop, and debug micro processor operating systems, related to Word Processing and Intelligent Terminal Family.

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Electrical/Logic Design Engineers

To work on the design and development of microprocessor based intelligent CRT terminal systems. Requires BSEE plus three years experience with 8080 or Z80 microprocessors; peripheral interface and controllers; TTL and MOS devices; CRT monitors, communications and/or disk control.

Product Engineers

Will provide design engineering support in the resolution of problems encountered in the manufacturing operation. Requires BSEE and design/re-design experience in the small business computer industry.

Cost Reduction Design Engineers

To actively work in reducing the cost of our product designs. Will apply expertise to video displays, power supplies and intelligent controller enhancement. Requires BSEE plus minimum two years experience in several of the above areas.

Peripheral Evaluation Engineer

Will perform peripheral device evaluations for our distributed data processing systems such as disk media, tape drives and printers. Requires BSEE with minimum two years experience with several of the above peripherals.

FIELD SERVICE

Sr. Technical Instructor

Presently we are seeking a seasoned Field Service professional with at least 3-5 years in the field and another 2-5 years experience in course development and class presentation. In depth knowledge of mini-computer systems and peripherals, such as tapes, discs, printers, card equipment, selectric and CPUs is required. The successful candidate will be a graduate of a 2 year technical school or equivalent in basic electronic and electrical studies. Experience in technical writing, machine language or diagnostic programming would also be helpful.

National Support Specialist

Due to our expanded operations, we have need for an additional national support specialist. We seek a Field Service professional with a minimum of 3 years hands-on experience in maintaining computers and related peripherals. Direct hands-on experience with commercial data communications equipment is required. Technical schooling graduates or those with an Associate's degree in Electronics (or military equivalent) will be considered. Technical expertise, as well as tact and personal confidence is essential to interface with customers and all internal technical groups. Approximately 25% travel involved. Initial orientation assignment may be in Europe.

NIXDORF COMPUTER

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Richard J. Neal, Manager of Employee Relations, Dept. 3100,
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The Microelectronics division of NCR is an industry leader, producing semiconductor devices which are the key to overall product development. Our staff of approximately 325 employees work in an atmosphere where new ideas prosper. Programmer/Analysts in our Information Systems area operate in an environment where their technical skills are acknowledged and appreciated.

Currently, we need individuals to work closely with user departments to define, develop and maintain appropriate information systems for all functional areas. Responsibilities encompass interactions with, and exposure to, Corporate MIS groups, located close by in Dayton, Ohio.

A Bachelor's Degree in Computer Science, or a degree in a related discipline which includes a strong computer science emphasis, is required. Programming skill in COBOL is essential. An additional two years experience with on-line manufacturing control applications and financial systems is preferred.

Our Microelectronics facility is located in a southern suburb of Dayton, Ohio, just a 45 minute drive from Cincinnati. The area affords a pleasant living and working environment, as well as a wide variety of social, cultural and education activities. The company provides outstanding group and fringe benefit programs for all employees.

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1012 Russell Street
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or call Tom Early at 301/539-2862 (Baltimore) or 202/621-1590 (Washington, D.C.)

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For this position, prefer experience with ACP Release 8.1 and beyond; and IBM 370/168 hardware. Familiarity with SVS in a PARS support role is a plus; Bachelors degree in Mathematics, Computer Science, Engineering required.

Starting salary approximately $2100 per month. If you are qualified for this position, and are seeking a competitive salary combined with excellent airline benefits, and suburban living, send your resume to:

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Due to the overwhelming acceptance of PANEXEC, Pansophic's sophisticated entry into the area of security software system, an immediate opening now exists for a career-oriented person to join our team of Product Support Specialist.

For consideration, candidate must demonstrate a solid understanding of operating systems (preferably both DOS/VS and at least one of the OS/VS systems) and have a minimum of one year assembler experience. Good analytical and problem-solving skills plus the ability to interface on a continuous basis with customers, field technicians and our research and development personnel would be considered essential for success.

In return for your expertise in the area of operating systems, we offer an excellent starting salary, liberal benefits and exciting prospects for future growth. **Forward a resume in confidence to: Tarie Yee, PANSOPHIC SYSTEMS, INC., 709 Enterprise Drive, Oak Brook, IL 60521, or**

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PANSOPHIC

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Perform requirements analysis, design, implementation, and support of various high-level medical DBMS subsystems: data manipulation language, multi-processor query systems, multi-processor communicatons software, data base definition interface. Develop handler programs for peripheral devices. Understand nature of research and aid end-users in medical studies: Coronary Artery Bypass Graft Surgery, diabetes mellitus, cost-effectiveness strategies in ambulatory care. Study end-user hgih-level DBMS interface.

Requriements: Master of Science degree in Computer Science or Systems Engineering or equivalent graduate level study and demonstrated knowledge of Operating System Design, Language Processors (both interpreters and compilers), Storage Management Systems and Data Base Management Systems. Knowledge of DEC PDP-11 hardware, including PDP-11/70 Central Processors and RPO4 dual ported disk drives and device driver techniques appropriate to this hardware. Knowledge of the internal operation and structure of the MIIS and UNIX operating system.,

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Please send resume, in confidence, to Maureen V. Murphy, Employment Manager.

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($26,022 - $39,975)

The Federal Trade Commission is seeking Systems Analysts to provide project management and systems analysis support for major antitrust investigations and cases.

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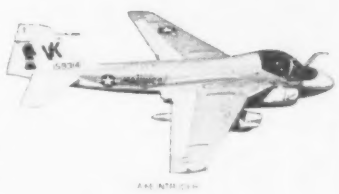

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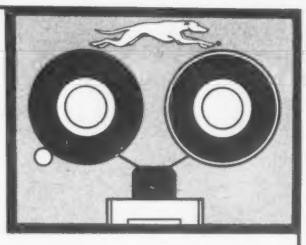

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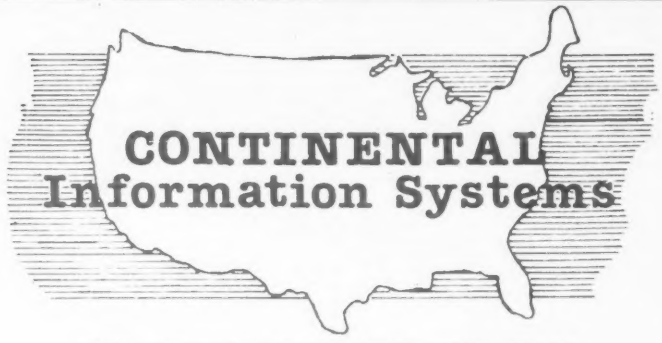

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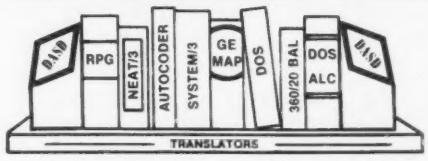

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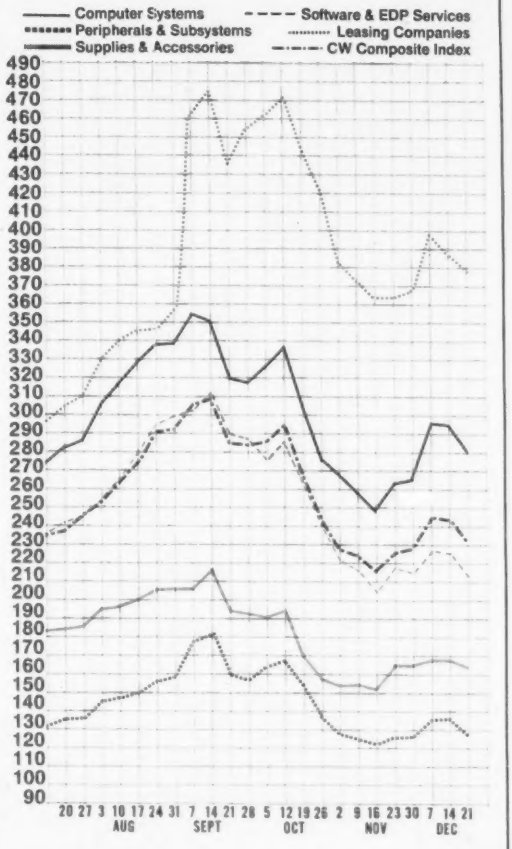

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Earnings	247,884	225,493

PRIME COMPUTER
Three Months Ended Oct. 1

	1978	1977
aShr Ernd	$.40	$.19
Revenue	26,040,000	13,672,000
Earnings	2,310,000	1,052,000
a9 Mo Shr	1.03	.48
Revenue	67,013,000	34,201,000
Earnings	5,936,000	b2,540,000

a-All per-share earnings are adjusted to reflect a May 23, 1978 two-for-one stock split. b-Includes tax-loss carryforward of $150,000.

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TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES TUESDAY, DECEMBER 19, 1978

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

E X C H		1978 RANGE (1)	CLOSE DEC 19 1978	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	28- 69	47 7/8	- 7/8	-1.7
N	BURROUGHS CORP	59- 87	70 7/8	+ 3/8	+0.5
O	COMPUTER AUTOMATION	15- 44	21	-1 1/4	-5.6
N	CONTROL DATA CORP	23- 46	32 3/4	-1 1/8	-3.3
O	CRAY RESEARCH INC	8- 33	29 1/2	-1	-3.2
N	DATA GENERAL CORP	42- 71	58 1/4	-1 3/4	-2.9
N	DATAPOINT CORP	34- 75	67 1/8	+ 7/8	+1.3
N	DIGITAL EQUIPMENT	39- 54	48 5/8	-1 3/8	-2.7
N	ELECTRONIC ASSOC.	2- 13	6	-1	-14.2
A	ELECTRONIC ENGINEER.	9- 19	10 7/8	-1 1/8	-9.3
N	FOUR-PHASE SYSTEMS	19- 46	28	-2 1/2	-8.1
N	FOXBORO	28- 40	30 7/8	-1 3/4	-5.3
O	GENERAL AUTOMATION	7- 26	15 5/8	-1 1/8	-6.7
O	GRI COMPUTER CORP	1- 3	1 1/4	0	0.0
N	HEWLETT-PACKARD CO	62- 93	88	+1 1/8	+1.2
N	HONEYWELL INC	43- 72	66 1/4	- 1/2	-0.7
N	IBM	236-305	282 7/8	+8 5/8	+3.1
O	MANAGEMENT ASSIST	9- 29	16 1/2	-1 3/8	-7.6
O	MANUFACTURING DATA S	9- 23	18	-1 1/8	-5.8
O	MICRODATA CORP	10- 23	17 1/8	-1 1/4	-6.8
O	MINI-COMPUTER SYST	4- 8	5 1/4	- 3/4	-12.5
O	MODULAR COMPUTER SYS	7- 17	13 1/2	-1	-6.8
N	NCR	37- 67	58	-2 7/8	-4.7
N	PRIME COMPUTER INC	20- 43	30	-1 1/2	-4.7
N	PERKIN-ELMER	17- 29	25 7/8	-1 3/8	-5.0
N	SPERRY RAND	33- 49	42	-1 3/8	-3.1
A	SYSTEMS ENG. LABS	11- 24	13 3/8	-1	-6.9
O	TANDEM COMPUTERS INC	13- 37	22 1/4	-2	-8.2
A	WANG LABS.	12- 32	28 3/8	- 3/8	-1.3
	LEASING COMPANIES				
O	BOOTHE COURIER CORP	13- 21	21	- 1/4	-1.1
O	COMDISCO INC	5- 22	13 3/4	-1	-6.7
A	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	2 5/8	- 1/8	-4.5
C	CONTINENTAL INFO SYS	5- 15	6 1/2	- 3/4	-10.3
M	DATRONIC RENTAL	1- 3	2 1/4	+ 1/4	+12.5
A	DCL INC	3- 5	4 3/8	0	0.0
N	DPF INC	8- 14	10	-1	-9.0
N	ITEL	16- 35	25 3/8	- 1/8	-0.4
N	LEASCO CORP	24- 36	33 1/8	-1 7/8	-5.3
O	LEASPAC CORP	1- 4	2 3/4	- 1/8	-4.3
A	PIONEER TEX CORP	3- 7	3 1/8	0	0.0
N	U.S. LEASING	13- 20	14 1/2	-1	-6.4
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	7/8	- 1/8	-12.5
O	ANACOMP INC	8- 22	11 1/8	- 5/8	-5.3
A	APPLIED DATA RES.	8- 17	10 1/2	- 1/2	-4.5
N	AUTOMATIC DATA PROC	24- 36	29 1/2	-1 1/2	-4.8
O	COLEMAN AMERICAN COS	1- 2	5/8	0	0.0
O	COMPU-SERV NETWORK	6- 12	5 1/2	- 1/4	-4.3
O	COMPUTER HORIZONS	1- 9	6 1/4	- 3/4	-10.7
O	COMPUTER NETWORK	6- 16	6	- 5/8	-9.4
N	COMPUTER SCIENCES	8- 17	10 5/8	- 3/4	-6.5
O	COMPUTER TASK GROUP	1- 4	4 1/2	0	0.0
O	COMPUTER USAGE	2- 4	2 3/8	- 1/8	-5.0
O	COMPUT AUTO REP SVC	4- 10	6 1/8	- 1/8	-2.0
O	COMSHARE	6- 19	14	-1 1/4	-8.1
O	CULLINANE CORP	14- 33	16 1/2	- 3/4	-4.3
O	DATA DIMENSIONS INC	4- 9	5	- 1/4	-4.7
O	DATATAB	1- 2	3/4	- 1/8	-14.2
N	ELECTRONIC DATA SYS.	15- 25	18	-1 5/8	-8.2
O	INSYTE CORP	1- 3	1 1/8	0	0.0
O	IPS COMPUTER MARKET.	2- 3	3	0	0.0
O	KEANE ASSOCIATES	3- 6	4 3/4	0	0.0
O	KEYDATA CORP	1- 3	1 5/8	0	0.0
A	LOGICON	10- 19	10 5/8	-1	-8.6
A	NATIONAL CSS INC	15- 36	23	-1 7/8	-7.5
O	NATIONAL DATA CORP	7- 13	8 1/8	- 1/2	-5.7
A	ON LINE SYSTEMS INC	12- 30	17 5/8	- 1/8	-0.7
N	PLANNING RESEARCH	4- 10	5 7/8	- 3/4	-11.3
O	PROGRAMMING & SYS	1- 1	1 1/4	- 1/8	-9.0
O	RAPIDATA INC	3- 7	4 1/8	- 1/4	-5.7
O	REYNOLDS & REYNOLD	18- 36	26 1/2	-1 3/4	-6.1
O	SCIENTIFIC COMPUTERS	3- 9	5 5/8	- 1/8	-2.1
O	TYMSHARE INC	18- 33	24 3/4	- 1/2	-1.9
A	URS SYSTEMS	5- 8	6 3/8	+ 1/4	+4.0
N	WYLY CORP	1- 7	4	- 1/2	-11.1
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	14- 32	20 1/4	-2 3/4	-11.9
O	ADVANCED MEMORY SYS	7- 18	12	-1 5/8	-11.9
N	AMPEX CORP	10- 19	15	- 1/2	-3.2
O	ANDERSON JACOBSON	5- 10	5 5/8	- 1/8	-2.1
N	APPLIED DIG DATA SYS	9- 22	9 1/4	- 7/8	-8.6
O	BEEHIVE INTL	3- 7	3 1/8	- 5/8	-16.6
A	BOLT,BERANEK & NEW	6- 14	11 1/2	-1 3/8	-10.6
N	BUNKER-RAMO	10- 20	15	0	0.0
A	CALCOMP	3- 13	5 1/2	- 1/4	-4.3
O	CAMBRIDGE MEMORIES	3- 9	4 1/4	- 3/4	-15.0
N	CENTRONICS DATA COMP	16- 37	22	- 5/8	-2.7
O	COGNITRONICS	1- 4	1 1/2	- 1/2	-25.0
O	COMPUTER COMMUN.	6- 87	5	- 7/8	-14.8
O	COMPUTER CONSOLES	4- 10	7 1/2	- 1/4	-3.2
A	COMPUTER EQUIPMENT	3- 6	3 3/4	- 1/8	-3.2
O	COMPUTER TRANSCEIVER	1- 3	4 1/8	0	0.0
O	COMPUTERVISION CORP	9- 30	21 1/4	0	0.0
O	COMTEN	9- 38	13 1/4	-1 1/4	-8.6
N	CONRAC CORP	13- 26	13 5/8	- 5/8	-4.3
	DATA ACCESS SYSTEMS	3- 14	10 3/4	- 1/4	-2.2
O	DATA 100	9- 20	19 1/2	0	0.0
A	DATA PRODUCTS CORP	14- 25	16 5/8	-1 1/8	-6.3
O	DATUM INC	2- 6	2 5/8	+ 1/8	+5.0
O	DECISION DATA COMPUT	2- 6	2 1/2	- 1/4	-9.0
O	DELTA DATA SYSTEMS	1- 1	5/8	- 1/8	-16.6
A	DOCUMATION INC	6- 34	20 3/8	-1 5/8	-7.3
O	DATARAM CORP	6- 32	15 1/2	-3	-16.2
N	ELECTRONIC M & M	4- 9	4 1/4	- 1/2	-10.5
O	FABRI-TEK	1- 2	7/8	0	0.0
O	GENERAL COMPUTER SYS	1- 3	2	+ 1/8	+6.6
O	GENERAL DATACOMM IND	9- 21	14	-1	-6.6
N	HAZELTINE CORP	10- 17	11 3/4	+ 1/4	+2.1
N	HARRIS CORP	17- 36	31 1/4	-1	-3.1
O	INFOREX INC	6- 11	6 7/8	- 1/2	-6.7
O	INFORMATION INTL INC	7- 12	6 3/4	+ 1/4	+3.8
O	INFOTON	1- 3	2 3/8	- 3/8	-13.6
O	INTEL CORP	39- 62	47	-2	-4.0
A	LUNDY ELECTRONICS	4- 8	4 1/2	- 1/4	-5.2
O	MSI DATA CORP	10- 19	10 3/4	- 1/4	-2.2
N	MEMOREX	27- 59	28	- 7/8	-3.0
N	MOHAWK DATA SCI	6- 15	8 7/8	- 5/8	-6.5
O	OMEX	2- 6	5 1/2	0	0.0
O	PARADYNE CORP	9- 17	9 3/4	- 5/8	-6.0
O	PENRIL CORP	5- 12	8 1/2	- 1/4	-2.8
N	PERTEC CORP	9- 17	11 1/4	-1 1/4	-10.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	QUANTOR CORP	2- 5	2 3/4	0	0.0
O	RECOGNITION EQUIP	7- 13	7 7/8	- 1/8	-1.5
O	SCAN DATA	1- 5	1 5/8	- 1/4	-12.8
N	STORAGE TECHNOLOGY	19- 46	29 5/8	- 3/4	-2.4
O	T BAR INC	11- 20	15	-1 1/4	-7.6
O	TALLY CORP.	4- 14	13 3/4	0	0.0
A	TEC INC	6- 13	6 1/2	- 1/2	-7.1
N	TEKTRONIX INC	33- 50	46 3/4	+ 1/2	+1.0
N	TELEX	3- 9	4 3/4	- 3/4	-13.6
O	TESDATA SYSTEMS CP	9- 23	9 1/2	- 3/4	-7.3
O	WILTEK INC	1- 2	1	0	0.0
	SUPPLIES & ACCESSORIES				
A	AMERICAN BUS PRODS	6- 11	7 3/8	- 1/8	-1.6
O	BALTIMORE BUS FORMS	2- 4	1 1/2	0	0.0
A	BARRY WRIGHT	14- 30	26 3/4	+ 1/4	+0.9
O	CYBERMATICS INC	1- 1	1/2	0	0.0
O	DUPLEX PRODUCTS INC	13- 30	16 1/2	- 5/8	-3.6
N	ENNIS BUS. FORMS	8- 17	12	+ 1/8	+1.0
N	3M COMPANY	43- 66	60	-1 1/8	-1.8
O	MOORE CORP LTD	26- 36	27 1/4	-1	-3.5
N	NASHUA CORP	18- 37	22 1/2	-2 1/8	-8.6
O	STANDARD REGISTER	20- 27	21 1/4	-1 3/4	-7.6
A	TAB PRODUCTS CO	8- 16	9 1/2	- 3/4	-7.3
N	UARCO	19- 50	49	- 1/4	-0.5
A	WABASH MAGNETICS	10- 22	13 3/4	- 5/8	-4.3
N	WALLACE BUS FORMS	18- 33	24 1/4	+ 5/8	+2.6

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